





# FORTY-THIRD ANNUAL REPORT

OF THE

# DEPARTMENT OF MARINE AND FISHERIES

1910

# MARINE

*PRINTED BY ORDER OF PARLIAMENT*



OTTAWA

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EXCELLENT MAJESTY

1910

[No. 21—1911.]







*To His Excellency the Right Honourable* SIR ALBERT HENRY GEORGE, EARL GREY,  
VISCOUNT HOWICK; BARON GREY OF HOWICK; A BARONET, G.C.M.G., &c., &c.,  
&c., &c., Governor General of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith for the information of Your Excellency and the Parliament of Canada, the Forty-Third Annual Report of the Department of Marine and Fisheries, Marine Branch.

I have the honour to be,

Your Excellency's most obedient servant,

LOUIS-PHILIPPE BRODEUR,

*Minister of Marine and Fisheries.*

DEPARTMENT OF MARINE AND FISHERIES,

OTTAWA, June, 1910.







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1 map in pocket



## REPORT

OF THE

## DEPUTY MINISTER OF MARINE AND FISHERIES

To the Honourable LOUIS-PHILIPPE BRODEUR,  
Minister of Marine and Fisheries.

SIR,—I have the honour to report on the transactions and service of the Marine Branch of the Department of Marine and Fisheries for the fiscal year ending March 31, 1910.

The work has been carried out largely in accordance with the estimates prepared and appropriations made by parliament for the year. The various branches of the department were engaged as usual in performing the work assigned to them so far as it could possibly be done. Fogs, gales and storms caused interruptions in carrying out the work, but efforts were made to overcome the difficulties with a fair measure of success. The delays which occurred in the completion of lighthouse construction and placing of buoys were not more serious than in former years, and in nearly all cases unavoidable.

A number of new light stations were established in different parts of the Dominion and repairs made at the existing lighthouses. Some lighthouses of a better class than the general order have been erected but more progress has been made in introducing higher orders of lighting apparatus, lanterns and lenses than in construction of lighthouses. Alterations of various kinds were necessary in a number of towers and fog-alarm buildings to prepare them for the reception of improved apparatus and several lightkeepers' dwellings were built while others were improved for the better accommodation of keepers.

Personal inspection of lighthouses by the officers in charge of construction was made occasionally when office work permitted, but continuous inspection was carried on by district engineers and local inspectors who reported to the department.

In accordance with the purpose of the department, to substitute modern lanterns with greater magnitude and better optical apparatus, for old fashioned lights, a number of important changes were carried out and this work is still progressing.

The open fall permitted vessels to reach their ports of destination with less difficulty than in most seasons and the ice-breaking operations under contract were carried on with more than usual success. The winter steamers running between Prince Edward Island and the mainland as well as the ferry steamer between River Ouelle and Murray Bay were able to continue on their routes with almost unprecedented regularity.



1 GEORGE V., A. 1911

Three new steamers were added to the fleet and put in commission; the *Earl Grey* in the winter service between Prince Edward Island and the mainland; the *Simcoe* in the lighthouse supply service above Montreal and in the buoy service in Georgian bay; the *Lambton* in the lighthouse construction service above Quebec in the St. Lawrence river and on the great lakes. The first steamer was put on her route after her arrival from Great Britain where she was built; the *Simcoe* also built in Great Britain began her work in July, 1909, and the *Lambton* built at Sorel, P.Q., entered upon her work in the spring of 1909.

Necessary overhaul and repairs were made to the other Dominion steamers and inspection of their hulls and machinery attended to by the Dominion steamboat inspectors. Several of these steamers are employed in eastern and western waters all the year round and attend to lighthouses, gas-buoys and other buoys made use of in the waters around the coast of Nova Scotia and the Bay of Fundy and British Columbia. The officers and crews of the vessels laid up for the winter were shipped at the opening of navigation and their work began as is customary.

The *Montcalm* and *Lady Grey* kept navigation open all winter at Cap Rouge, enabling small vessels from lower ports to navigate the St. Lawrence river at an earlier date than in former years.

The work in the St. Lawrence ship channel was advanced in a greater degree than in 1908 when fogs and smoke from forest fires impeded the dredging and surveying. At the Sorel shipyard, building of tugs, scows and dredges progressed and improvements of the plant formed a considerable item of expenditure of labour and money.

The work of steamboat inspection received the attention of the chairman of the Board and the steamboat inspectors, and certificates to engineers were issued. Inspection of live stock shipments and other cargo was carried on throughout the year; at Montreal during the season of navigation and at St. John, N.B., and Halifax in the winter season. Certificates to masters and mates were granted and lectures delivered at the marine schools, but I regret to say that the attendance at the schools in most ports was disappointing. Medical attendance at marine hospitals and by port physicians was kept up and many seamen received the benefit of this service. Wireless telegraph stations were increased and the service improved. The meteorological service was continued and a number of paid and voluntary stations established. Tidal surveys occupied the time of the officer in charge and his staff, on the eastern and western coasts and tide tables were published.

Annual reports of the agents of the department in the maritime provinces, Quebec, Montreal and British Columbia, were sent to Ottawa and continued comprehensive and detailed information regarding the various kinds of service under the supervision of the agents. Changes were made by the appointment of new agents; one at Halifax to fill the vacancy caused by the death of the former agent; one at St. John, owing to the retirement of the previous agent, one at Charlottetown to replace the former agent who was appointed inspector of lights from choice, and an agent was appointed at Montreal with extended jurisdiction. Within the department at Ottawa, the purchase of supplies occupied the attention of the purchasing agent and a considerable staff.

During the years 1908 and 1909, the Arctic expedition was sent to the northern archipelago and patrolled the waters in Lancaster sound, Baffin bay, Davis strait and



## SESSIONAL PAPER No. 21

part of Hudson strait. The Lighthouse Board held several meetings to advise on the subject of establishing new aids to navigation for which applications had been made.

The correspondence has been voluminous, exceeding by many thousands of letters those received and sent out in former years. A large distribution of stationery, reports, forms and Acts of Parliament took place. The life-saving service and humane institutions were maintained as usual.

Consideration was given, during the year to the matter of constructing a navy for Canada, involving the employment of experts who furnished opinions on the question.

More extended summaries of the transactions of the department will be found in this report, as I proceed, under separate headings and the detailed reports of officers form appendices. The reports of the officers have been read and at this point, I submit a list of the subdivisions of the Marine Branch, which will give some idea of the wide range of subjects that must necessarily be dealt with in carrying on the correspondence under your directions.

The construction of lighthouses and fog alarms.

The maintenance of lights, gas buoys and other buoys.

The lighthouse board, which decides the necessity for aids to navigation.

The hydrographic surveys.

The ship chanel St. Lawrence river, the Sorel works.

Meteorological and magnetic service.

Investigations into wrecks.

Board of steamboat inspection.

Cattle shipments inspection.

Wireless telegraph service.

Marine hospitals.

Submarine signals.

Shipping under the Merchants Shipping Act.

Legislation and administration of laws relating to the Department of Marine and Fisheries.

Humane service in connection with seamen.

Wrecking plant subsidized.

Winter communication.

Removal of obstructions to navigation.

Examination of masters and mates and issuing certificates.

Naval militia.

Pilotage.

Government of ports and proclaiming of harbours in the Dominion.

Control of harbours and government wharfs.

Dominion steamers, Marine and Fisheries.

Hudson bay and navigation of northern waters.

The accounts of the department were examined and checks issued. The expenditure in connection therewith has been kept within the estimates as shown in the following statement. The expenditure in a more detailed form will be found in Appendix No. 5 of this report.







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*Fisheries—*

Appropriation.. . . . .	\$1,284,405 00
Expenditure .. . . . .	995,359 34
<hr/>	
Expenditure less than appropriation.. . . . .	\$ 289,045 66
<hr/>	
Grand total appropriation.. . . . .	\$6,732,767 74
Grand total expenditure.. . . . .	5,687,665 78
<hr/>	
Grand total expenditure less than appropriation..	\$1,045,101 96
<hr/>	
Grand total expenditure in 1908-9.. . . . .	\$6,290,260 45
“ “ 1909-10.. . . . .	5,687,665 78
<hr/>	
Amount less in 1909-10.. . . . .	\$ 602,594 67
<hr/>	

The greater expenditure in 1908-9 was largely due to the construction of steamers. The expenditure for fishery bounties is not included in the fisheries expenditure.

## LIGHTHOUSE SERVICE.

The lighthouse service has been conducted, in some agencies, with less interruption than usual, largely due to freedom from accidents. The agent at Quebec has specially mentioned the fact that in his district, covering a coast and river distance of 1,000 miles, the ordinary attendance to the lights and delivery of supplies had been successfully carried out. The extent of the Quebec district is somewhat diminished since the extension of the Montreal agency, and now comprises the waters from Platon above Quebec to Belle Isle, the Saguenay river, Lake St. John, Baie des Chaleurs north end and west coast of Newfoundland and Labrador. The delivery of supplies in the lower part of the Montreal agency, was continued by the Quebec agency for the season of 1909.

The Nova Scotia district, extends all around the coast of that province, with the exception of a short distance in the Bay of Fundy, which, for convenience, is included in the New Brunswick agency; the lights at Cape Race, Newfoundland and St. Pauls and Sable islands are included in the lights receiving attention from the agency at Halifax.

Detailed reports of work to lighthouses and delivery of supplies, are included in the annual report of the Nova Scotia agent, and show that the work included numerous repairs to lighthouses owing to the large number on the coast, and to the fact, that many lights and fog alarms are in operation all the year round.

The New Brunswick agency, extends along the coast of the province in the Bay of Fundy, including part of Nova Scotia as far as Yarmouth, and around the coast on the north side of the province, from Baie des Chaleurs to the provincial boundary in the Strait of Northumberland. The work in this district, was carried on generally, in a more effective manner than in previous years, due to the employment of an additional steamer.



In British Columbia, the rapidly increasing number of fog alarms and lights, has caused the employment of more steamers and a larger staff to perform the lighthouse service. The agent at Victoria, has reported upon the work under his supervision, noting in detail, the visits of lighthouse steamers with supplies and the repairs made at different lighthouses. He has not reported any interruption to the usual work of his agency.

The Montreal agency, now extends from Platon above Quebec to Ottawa, Ontario, including Lake Memphremagog and the Richelieu river as far as Lacolle. The service in this district has been more efficiently performed than formerly owing to the additional aids employed to carry it out. The agent has reported upon arrangements for carrying out the work efficiently.

Prince Edward Island remains with the same limits of the agency, namely, the geographical boundaries of the province. More effective means were employed, during part of the year, in superintending lighthouse service by the appointment of a superintendent of lights.

Lighthouse work in Ontario, extended from Montreal to the head of the great lakes at Thunder bay. The new steamer *Simcoe* was engaged in the delivery of supplies to the different stations. The Dominion lighthouse depot situated at Prescott received orders and shipped to different lighthouses in the districts, numerous articles used in connection with the illuminating apparatus, while the unwatched lights and beacons in the St. Lawrence river, were supplied with carbide from this depot. Similar attention was given to the unwatched lights and beacons in the Georgian Bay district, by the officers at Depot Harbour, Parry Sound. The ordinary lighthouse supplies were delivered under the supervision of the Superintendent of Lights for the district above Montreal who has his office at Ottawa.

Delivery of supplies to the lighthouses was done under the supervision of the superintendent of lights, in each division, who reported to the agent; the superintendence of construction and repairs to lighthouses was performed by the district engineers and local inspectors under directions of the chief engineer's branch.

The lighthouse supplies and material for repairs were conveyed by Dominion steamers to the different stations.

Construction of lighthouses, fog-alarm buildings, keepers' dwellings and pole lights, as well as repairs to lighthouses in the divisions, have been reported upon by the chief engineer in his detailed report.

The total number of lightstations, separate fog-alarm stations, and lightships is 978; the number of lights attached to these stations is 1,227, which number includes pole lights; number of steam fog-horns, bells and trumpets 133; gas beacons 32; gas buoys 254; whistling buoys 24; bell buoys 50; submarine bells 10.

Notices to mariners were regularly issued, respecting changes in the old list of lights and buoys, and the establishment of new aids to navigation. Particulars pertaining to these notices, and all matters regarding construction of lights, fog-alarms and repairs to lighthouses, fog-alarm buildings, keepers' dwellings and lighthouse piers will be found in the report of the chief engineer, which forms Appendix No. 1 of this report.



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## TIDAL SURVEY.

The tidal survey under the direction of Dr. W. B. Dawson, was largely confined to the Pacific coast during the past season. Tide gauges were placed at selected points to obtain a basis for the determination of tidal differences at intermediate places. A series of twenty recording gauges were in simultaneous operation along the coast. It has been ascertained that the whole coast of British Columbia, can be referred, for tidal purposes, to three principal stations, namely Clayoquet, Sand Heads and Port Simpson.

The stations are divided into principal stations and secondary stations on the Atlantic and Pacific coasts of the Dominion.

Tide tables have been published and circulated on both coasts; the number now reaching, with abridged editions, 15,000. The report of Dr. Dawson is included in the report of the chief engineer.

## REMOVAL OF OBSTRUCTIONS TO NAVIGATION

Delay in the removal of wrecks or sunken vessels and sunken material has always been a source of complaint owing to the indifference shown by owners of such property in connection with the removal of the obstructions. In every case, when the department is notified of the obstruction, the owner of the property is requested to remove it forthwith, but delay often arises, sometimes from neglect and in other instances from inability to defray the cost of the work of removal. In some cases the owners of vessels ask for a reasonable extension of time in which to raise the property in order that it may not become a total loss, which is generally given, but the delay is often prolonged. In such an event, and in cases of refusal to remove the obstruction, the department has the work done by contract and the wrecked property is given to the contractor as part payment. In a few instances, the owners of vessels remove them without expense to the department. This occurred in one instance, only, out of four obstructions during the past year. Three other removals cost \$3,250. The department has recourse by first making a claim for recovery of the money from any owner; if payment is refused then by action at law if the owner or owners are British subjects.

The places where the casualties occurred and the cost of the removal of the sunken vessels, are mentioned in the report of the chief engineer.

## ICEBREAKING IN ONTARIO HARBOURS.

Two contracts for prolonging navigation in important ports are running; one for the Thunder Bay district for keeping open until all vessels for the season have arrived, the harbours of Fort William, West Fort William and Port Arthur and for opening them in the early spring. This contract includes the conveying of lightkeepers from isolated stations in the vicinity to landing places convenient for the keepers. The sum of \$30,000 per annum is paid the contractors.

A much smaller contract amounting to \$3,200 was entered into for the work of keeping open Midland and Tiffin harbours in Georgian bay for the fall of 1909.



## ILLUMINANTS, ILLUMINATING APPARATUS AND GAS BUOYS.

In the report of the Acting Commissioner of Lights will be found a detailed account of the work done in his branch.

This branch attends specially to lighting apparatus, warning and gas buoys and illuminants. The principal work performed has been the installation of lanterns and their attachments at new lighthouse stations, the substitution of modern dioptric apparatus in a number of major coast lights and the improvement of minor lights, by the use of petroleum vapour as an illuminant, and the maintenance of lights throughout the Dominion.

The lighting apparatus now in use in the Dominion lighthouse service consists of lanterns, in which are operated distinctive lights known as quick flashing lights, occulting lights, fixed lights (red and white), anchor lenses for pole lights and a few Wigham 30-day lights. The reflector or catoptric apparatus is used for revolving and fixed lights. The illuminants used, consist of oil, oil vapour, and acetylene (compressed and automatically generated) and pintsch gas.

In the Quebec district, acetylene has been substituted for pintsch gas in lighting buoys; an exception, however, has been made in retaining pintsch gas for the Beaujeu pier light. The apparatus for making this kind of gas has consequently not been much used of late.

The submarine bells have given much satisfaction both by their uninterrupted operation for the past three years, and excellent service as a warning. The equipment has been operated at four shore stations and on five lightships.

Some particulars respecting the distance at which the bells have been heard by officers on board ships are here mentioned and will be interesting: *Empress of Ireland*, March 17, 1910, bell of Sambro buoy heard six miles distant. *Empress of Ireland*, April 23, same buoy, five miles distant; *Empress of Ireland* same day Lurcher shoal lightship, Bay of Fundy, bells were heard ten miles away. R.M.S. *Victorian* March 25, 1910, bell of Sambro buoy heard four and a half miles distant. R.M.S. *Victorian* April 2, bells of same buoy heard two and a half miles away. R.M.S. *Victorian*, April 23, bells of Chebucto Head, N.S., station heard three and a half miles. R.M.S. *Victorian*, April 24, bells of Lurcher shoal lightship heard two and a half miles. *Montezuma*, March 31, bells of Sambro buoy heard six miles distant. *Ionian*, March 30, Sambro buoy bells heard three miles. *Tunisian*, April 22, bells of Lurcher shoal lightship heard six and a half miles.

The commander of the *Mackay Bennett* cable steamer has reported having altered his course by the sound of the bells at a much greater distance than ten miles.

The acetylene and other buoy service in the several agencies have been given attention, so far as lifting and placing are concerned, by the steamers belonging to those agencies and in the upper part of the St. Lawrence river, by the *Scout* and in the Georgian Bay district, by the *Simcoe*. The charging and re-charging of acetylene buoys, beacons and lighthouses with calcium carbide has been performed by the crews of these vessels under officers familiar with the work. In British Columbia the acetylene buoys have been increased in number and numerous beacons are now illuminated



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by acetylene. The work in this province has been greatly facilitated by the addition of the *Newington*, purchased last year. Arrangements have also been made for establishing a base of operations at Prince Rupert for northern waters.

The report of the Acting Commissioner of Lights contains much valuable detailed information in inclosures, and one specially comprehensive table, exhibits the total number of aids to navigation in the Dominion, excepting spar buoys which are maintained under contract and by harbour masters. The report of the Acting Commissioner of Lights forms Appendix No. 2 to this report.

## RIVER ST. LAWRENCE SHIP CHANNEL.

The project of deepening and widening the St. Lawrence river ship channel, received the continued attention of the department during the season of navigation of 1909, and the work was advanced another stage towards completion. It followed along the direction of the projects of 1899 and 1906 for the improvement of the ship channel, to enable deep-sea-going vessels to pass to and from Montreal. The projects have been outlined in several annual reports previously, but being so important an undertaking, and one that has been so fruitful of good results in opening the way for large vessels to dock at Montreal, the scheme is here referred to again and also for the purpose of showing the advance that has been made in carrying it out.

The project of 1899, had in view the dredging of portions of the main channel between Montreal and Quebec, to a depth of 30 feet, at extreme low water, where a sufficient depth of water did not exist for large vessels, the datum being the low water mark of 1897. The minimum width of channel contemplated was 450 feet in the straight portions, and from 550 to 750 feet at the curves, with an anchorage ground to be provided in Lake St. Peter, an enlargement of the river.

The project of 1906, had in view a channel below Quebec, of 30 feet in depth at low tide at St. Thomas flats and at Beaujeu Bank, and not less than a 1,000 feet in width everywhere.

The contracted part of the river is known as the ship channel, and extends from Montreal to the Traverse, a distance of 220 miles: the total length of the work of dredging determined upon is seventy miles. The work has been successfully carried out excepting two miles of shale rock at Cap a la Roche, about one mile at Grondines; about one mile at St. Augustin bar, about one mile of widening at Ste. Croix and one half mile of widening at a point in Lake St. Peter, yet to be done. The work at Cap a la Roche will probably require from three to four years to complete, while the remaining undredged part to Quebec should be finished at the same time or perhaps within a year later.

Deep draught vessels arriving at St. Augustin bar and Cap a la Roche, are assisted by the rising tide. A semaphore at St. Jean des Chaillons, indicates the available depth at Cap a la Roche and a semaphore at St. Nicholas, indicates the depth of water over the undredged bar at St. Augustin.

The cost of dredging, sweeping and other work, so far, has been \$7,781,494.21 and the plant, shops and surveys, &c., \$3,618,522.60; a total of \$11,400,016.81; the total



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number of yards of material removed consisting of very hard shale rock, hard pan, boulders, sand and soft blue clay amounted to 68,121,577 cubic yards, scow measurement.

The channel is now available for deep draught vessels of 15,000 tons and the new steamers *Laurentic* and *Megantic* of the White Star Line, of that tonnage, have been navigating the channel to Montreal during the season.

The total work accomplished is described in the report of Mr. V. W. Forneret, superintending engineer, in a concise and yet comprehensive manner. He has specified the dredging done in 1909 by each dredge, and the total number of cubic yards of various kinds of material removed during the season, to be 6,266,821 at a total cost of \$527,268.77 or 8 $\frac{41}{100}$  cents per cubic yard.

In the five divisions of the channel where operations have been carried on, the work is completed in division 1, extending from Montreal to Sorel and in division 2, from Sorel to Batiscan, whilst progress was made during the season in division 3, Lake St. Peter, division 4, Batiscan to Quebec and in division 5 between Quebec and the Traverse; the total length of channel dredged during 1909, was 6.88 miles. Sweeping operations were carried on in a manner described in Mr. Forneret's report, showing that no filling in of any consequence had occurred nor were boulders found in the dredged parts. The gauge at Sorel, indicated that at no time during the season was the water in the channel of a less depth than about 31 feet, 30 feet 11 inches being the least depth registered: the greatest depth was 42 feet 7 inches.

In connection with the projects referred to, the physical features of the St. Lawrence river were taken into consideration and believed to be of a most favourable nature in regard to the question of filling in. Time and experience have proven the correctness of the opinion that no danger would arise from this cause. The yearly practice of sweeping has shown that no deposits of sediment of any appreciable extent have been made. The bottom of the channel being principally of a hard nature, no soft or movable material from within the channel, is liable to interfere with navigation except in one or two localities where coarse sand formed the bed of the river, and where dredging has been repeated. The principal source of the river being the great lakes, sediment is settled in these basins and does not reach the St. Lawrence and the general freedom from freshets arising from the entrance of streams, leaves the water clear. Ice in the spring of the year, however, dams the water at certain points, but so far this condition has not had any injurious effect.

Marine signal stations are established at twelve places from Quebec to Montreal and communication exists by a private through telephone system. The terminal station at Montreal was changed from the Harbour Commissioners building to the departmental offices at 223 Commissioner street, where more suitable quarters were obtained. Upon the suggestion of the Shipping Federation of Canada, the day signals were changed from flags to cones, balls and drums as the flags in calm weather could not be distinguished; the change proved more satisfactory. The signals at night are lights. The Sorel and Longue Pointe station buildings were raised and alterations made at Quebec to give better accommodation.

A most interesting event occurred in closing the negotiations, which had been carried on for two years, in connection with acquiring the old windmill for a station,



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at Verchères. This windmill has most interesting associations, having been built in 1690, and, not only forms a most picturesque land mark, but a most useful addition to the stations. An interesting account of its construction and some of the events which occurred in its vicinity, and in the early history of Canada, is recorded in the report of the superintending engineer of the ship channel.

I here record the annual official inspection made by yourself accompanied by representatives of the Shipping Federation of Canada, Montreal Board of Trade, La Chambre de Commerce, the Montreal and Quebec Harbour Commissioners and representatives of the Montreal and Quebec pilots, myself and other officials of the department. On the whole, satisfaction was expressed at the progress and permanent nature of the work, but the announcement made by you of the intention of the government to proceed with the deepening of the channel to 35 feet was greeted by still greater evidences of satisfaction.

The ship channel plant is now the most powerful, extensive and complete dredging equipment in the Dominion, and it is doubtful if a superior plant can be found anywhere, but the addition of stone crushers, one of which has been ordered as an experiment, will make the plant perfect for the further project of deepening this, one of the most important channels of the world.

The list of the different kinds of dredges, scows, stone lifters, tugs, and other portions of the equipment will be found in the report of the superintending engineer.

Tabular statements of the total amount of work done to date, as well as of the work performed in 1909, have also been prepared and furnish, at a glance, concise information. These tabular statements consist of details of the average depth of the water in the channel at low water when the channel was called a 27½-foot channel, from the years 1890 to 1906, and the average depth of water since it has been dredged to a 30-foot channel, from the year 1907 to the end of 1909; statement of progress of dredging operations to the close of 1909; statement of miles of dredging in each division to the close of 1909; statement of work done by each dredge during the year 1909 and statement of classification of disbursements for the fiscal year ending March 31, 1910, and cost per cubic yard of dredging.

The ice-breaking operations for the spring of 1909-10 are also described in detail in the same report and it will be seen that they were carried out in the winter of 1909-10 more successfully than it has been possible to perform this service in any previous winter season. This was largely due to the mild winter and the absence of the usual heavy ice, although, the river had been frozen over solidly from Montreal to Cap Rouge and an ice jam had occurred at the latter point. The ice-breaking work resulted in preventing floods between Three Rivers and Quebec, earlier navigation to Montreal and a longer season for dredging operations.

The report of the superintending engineer of the ship channel forms Appendix No. 3 of this report.

## SOREL SHIPYARD.

At the beginning of the fiscal year, the staff of officers and workmen was busily engaged in making repairs to the vessels of the St. Lawrence ship channel and vessels belonging to other branches of the department, also to a dredge of the Public Works Department.



The ship channel fleet consists of nine dredges, nine tugs and complement of scows, coal barges, stone lifters, floating shop, &c., and three inspection boats; the ice-breaking tug *Lady Grey* belongs to the ship channel fleet.

The *La Canadienne* of the hydrographic survey service, the *Maisonnette* of the light and buoy service on the Ottawa river, the *Shamrock* and *Acetylene* of the St. Lawrence river buoy service, and the *Verchères*, *Hosanna*, *Alpha*, and several scows of the construction of lights branch and dredge *International* of the Public Works Department, were the vessels undergoing repairs and fitting out for the spring and summer of 1909. The details of the principal part of the work done on the above-named vessels were described in the annual report of the previous year, therefore, the completion of the repairs and alterations needs only a reference here.

At the same time that repairs were proceeding, a staff of men was employed at construction on lighthouse tender No. 21, named the *Montmagny*, on dredge No. 19 and a tug No. 29.

During the rest of the fiscal year, the building of these vessels was continued and also No. 20—a stone lifting scow, and work was begun on construction No. 24—a dipper dredge.

Material was ordered for the construction of an elevator dredge, a sand scow and a coal barge and partly received during the winter of 1909-10.

The summer and fall work at the ship yard consisted partly of keeping the St. Lawrence ship channel fleet in repair and repairing tugs and barges taken to the slipway to be hauled out and overhauled. The following were placed upon the slip: the *Acetylene*, *Alpha* twice, barge *Beauport* for the Department of Public Works, the tug *Carmelia* and *Cartier*.

All buildings were kept in repair and painted. The narrow gauge railway was kept in working order and a crane installed over the standard gauge track in the ship yard. The crane has a capacity of thirty tons and is equipped for quick discharge of lighter weights.

The bending rolls purchased in 1908, were put under permanent covering by the erection of a new building as an extension to the boiler shop. The traveller in the boiler shop was altered, and its track extended to the new part of the building, so that plates can now be handled at the rolls and carried to the main shop, where the boilers are made.

The financial report of the director of the Sorel ship yard, shows the expenditure charged to the different branches for which the work was done, to be \$1,132,423.81 for the fiscal year ending March 31, 1910. The report of the Director of the Sorel shipyard forms appendix No. 4 of this report.

## DOMINION STEAMERS.

### NORTHERN WATERS.

#### *The 'Arctic.'*

The *Arctic* is a single screw wooden vessel built in Keil, Germany, in 1901, and bought by the Department of Marine and Fisheries in 1904. She is 161.4 feet long, 37.2 wide, and 20.2 deep; she is 518 net, 762 gross tonnage, and 44 horse-power.



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She is in command of Captain Bernier, and returned from her northern expedition on October 5, after a fourteen months' cruise. The officers and crew were in good health.

## QUEBEC DISTRICT.

*The 'Eureka.'*

The *Eureka* is a single screw steel vessel, built in Glasgow, Scotland, in 1893, for the Department of Public Works, is now in the pilot service of this department. She is 94.7 feet long, 22 feet wide, 11.9 feet deep; 170 gross, 91 net, tonnage, and 40 horse-power.

The *Eureka* carries a crew of nineteen men, leaves Quebec early in the spring, and returns usually late in the fall. She was taken off her station on October 12, placed on Davie's patent slip, and on the 30th, replaced the *Champlain* while the latter was undergoing repairs, and again resumed the pilot service at Father Point, until December 2, when she was replaced by a surf boat, which disembarked the pilots of four vessels.

Pilots to the number of 1,185 were either embarked or disembarked by the *Eureka* during the season of navigation.

*The 'Montcalm.'*

The *Montcalm* is a powerful ice-breaker, specially designed for the St. Lawrence river service. She was built at Yoker, G.B., in 1904, and is a twin screw steel vessel, 245 feet long, 40.6 feet wide, and 15.7 feet deep; 526 net, 1,432 gross tonnage, 406 nominal and 4,250 indicated horse-power at a steam pressure of 220 pounds.

She is in command of Captain Edgar Pelletier, carries a crew of sixty men, and is employed during the season of open navigation, in the lighthouse and buoy service in the Gulf of St. Lawrence and Strait of Belle Isle.

She left Quebec, on her first trip, July 5, for Belle Isle, Newfoundland Coast, Bird Rock, Brion island, and the Magdalen islands. She carried workmen, lighthouse supplies, construction materials, and, after having made a very successful record-breaking voyage of over 2,000 miles in twenty days, returned to Quebec on July 25.

Returning from a second trip to the Magdalen islands, on August 15 she took a cargo of lighthouse supplies aboard, and sailed on the 20th for Anticosti, Gaspé, and Baie des Chaleurs, supplied forty-nine of the stations, sailed 1,000 miles, and returned on September 4.

She then supplied the north shore lights, relieved workmen on South West-Belle Isle, returned to Quebec, and had her hull, boilers, and machinery overhauled and repaired in preparation for the winter service.

Assisted by the C.G.S. *Lady Grey*, the *Montcalm* kept the channel at Cap Rouge open all winter and opened the channel to Three Rivers, and from Three Rivers to Sorel and Montreal, before April 4.

These achievements are unique in St. Lawrence navigation, demonstrating the possibility of keeping the channel from Montreal to the sea open all winter.

By special departmental order, the *Montcalm* sailed to Seven islands on October 18, with thirty-two tons freight and twenty-seven bags of mail matter. She



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started on a second trip there on March 3, carrying twenty-three passengers, twenty-seven bags of mail matter and twenty-seven tons of freight, and making the round trip in three days.

*The 'Druid.'*

The *Druid* is a single screw steel vessel, built in Paisley, Scotland, in 1902. She is 160 feet long, 30.1 wide 12.5 deep; 149 net, 503 gross tonnage, and fifty-nine horse-power.

This vessel is in the buoy and lighthouse service of the Quebec agency of the Department of Marine and Fisheries from Platon to Father point. She is commanded by Captain Michel Gagnon and carries a crew of thirty-one men. During her operations, last season, she is reported to have sailed a distance of 12,824 miles and used 1,955 tons of coal.

Her hull, engine, and Marconi wireless telegraph instruments were put in good repair under the direction of the Quebec agency.

*The 'Champlain.'*

The *Champlain* is a screw, steel vessel, built in Paisley, Scotland, in 1904. She is 120 feet long, 30.3 feet wide, and 17.6 feet deep; 225 net, 522 gross tonnage, and eighty-seven horse-power.

This ice-breaker is employed all the year in the ferry service between Rivière Ouelle wharf and Cap-à-l'Aigle, St. Irénée, and Murray bay.

She made two round trips daily, from June 28 to October 16, except on Sundays, when only one round trip was made. She made only one round trip daily, during the balance of the year. She failed to cross thirteen times, owing to snowstorms and heavy ice, and rendered unusually good service during the last winter due to the mild weather which prevailed.

The *Champlain* was withdrawn from the service, on May 29, and entered the graving dock on the 31st of the same month.

During her absence, she was replaced by the steamer *Contest*. She resumed her operations on June 22. The *Champlain* was again withdrawn on October 30 to undergo repairs to her hull and machinery. She was replaced by the C.G.S. *Eureka*, and again resumed her usual services on November 18.

The *Champlain* employs a crew of twenty-five men, carried 8,961 passengers, a large quantity of freight, baggage, express and mails. She provided 914 meals to passengers.

The receipts for the fiscal year amounted to \$6,301.78.

*The 'Rouville.'*

The *Rouville* is a screw steamer built at the government shipyard, Sorel, in 1906. She is 120 feet wide, and 16 feet deep.

She is commanded by Captain Aristide Belanger, carries nineteen of a crew, and is under the control of the lighthouse construction branch of this department.

She replaced the *Eureka* from October 12, to December 2, while the latter steamer was replacing the *Champlain*, then undergoing repairs. She went out of commission on December 9, and wintered in the Louise basin.



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*The 'Christine.'*

The *Christine* is a single screw iron vessel, built in Glasgow, Scotland, in 1881. She is 126 feet long, 17.2 wide, and 9.9 feet deep; is 95 net, 140 gross tonnage, and forty horse-power.

She is under the command of Captain M. May, and was employed during the whole season in the preventive service, under the direction of the Department of Customs, but was repaired and fitted out by the Quebec agency of the Department of Marine and Fisheries.

## NOVA SCOTIA DISTRICT.

*The 'Lady Laurier.'*

The *Lady Laurier* is a twin-screw, steel vessel, 214.9 feet long, 34.2 feet wide, 17.2 feet deep; 413 net, 1,051 gross tonnage, and 186 nominal horse-power. She was built in Paisley, Scotland, in 1902, and is employed in the lighthouse and buoy service in the Halifax agency of the Department of Marine and Fisheries.

The *Lady Laurier* was sent to deliver supplies to Cape Ray light station, Newfoundland, and on her way encountered ice off Whitehead, Nova Scotia, on March 30, 1909, which stripped her propeller blades, leaving the vessel helpless.

She left Whitehead in tow of the *Aberdeen* on April 1, reached Halifax on the 3rd, was hauled up on the marine slip on the 6th, had her fore body and top sides cleaned and painted and anchor chains renewed. Her deck planking and deckhouse were repaired and various minor repairs made.

Her boilers and machinery received a thorough overhauling, and repairs, in December, 1909. Hoisting gear and mast were repaired and propeller blades renewed.

She continued doing excellent work in the light and buoy service. January 23, while sailing west with buoys she lost her port propeller blades and, in consequence, had to return to Halifax and divers were employed to replace them.

From that time until March 31, she was continually employed in her usual service.

*The 'Aberdeen.'*

The *Aberdeen* is a single screw steel vessel built in Paisley, Scotland, in 1894. She is 180 feet long, 31.1 feet wide, 16.9 feet deep; is 266 net, 674 gross tonnage, and 200 nominal horse-power.

She is employed in the lighthouse and buoy service in Nova Scotia agency of this department.

The *Aberdeen* left Whitehead on April 1, 1909, taking the *Lady Laurier* which had her propeller blades stripped by ice, in tow, to Halifax, where she landed on the 3rd. On the 6th she sailed to Sambro and placed the gas buoy in proper position, which had drifted two and a quarter miles from its place; the steamer during the remainder of the month was placing buoys along the coast.

On May 7, she landed part of the humane establishment staff, cargo, and coal at Sable island and returned to Halifax, and continued placing and lifting buoys, until June 13, when off Devils island, her condenser began to leak and the ship, in consequence, returned to Halifax, where she remained until the 17th fitting, cleaning and painting.



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She then resumed her operations until July 27, when she was docked at Halifax. She remained in dock until September 29, undergoing a general overhauling and repairs to her hull, machinery, and rigging. After leaving the dock, she took supplies for Flint island, Cape North and Cape Freels, Newfoundland. She left Cape Freels on November 8, taking five men on board and sailed for Sydney.

While at South Sydney, she took the harbour master, and proceeded to South Arm to move two wrecks which obstructed navigation there, out to sea. She failed to move wreck No. 1, but succeeded in moving No. 2. She proceeded to Halifax, visited Cerebus gas buoy and again sailed for Cape Freels, Newfoundland, on October 13, landed provisions, lumber, and men, at Cape North.

On November 4, she landed supplies at Sable island, left Halifax for Magdalen islands, on the 25th, and lifted Cape Bear automatic buoy, Indian point gas buoy, Tryon shoal buoy, Bedeque buoy, Zephyr rock, Cape Tormentine buoy, and other coast buoys, during the balance of the year.

#### NEW BRUNSWICK DISTRICT.

##### *The 'Lansdowne.'*

The *Lansdowne* is a wooden steamer built at Maccan, N.S., in 1884. She is 188.6 feet long, 32.1 feet wide, 15.8 feet deep; 463 net, 680 gross tonnage, and eighty nominal horse-power. She is employed in the lighthouse and buoy service of the New Brunswick agency of the Department of Marine and Fisheries. She was in the light and buoy service from the first of the fiscal year until August 17, when she was placed on the blocks at St. John, N.B., for repairs. The fore end of false keel was renewed, fastenings at lower end of stern post repaired, her bottom cleaned, repaired and painted, beam in after hold renewed, bulwark partly repaired, defective planking of bridge deck repaired around stanchions, caulked in after well deck; four ring bolts renewed, deck lights repaired, bulkheads renewed, life-belt lockers built, surf boat repaired, officers' and sailors' quarters renovated and painted, two new life buoys and forty life preservers were provided to replace old ones.

The engines and machinery were overhauled and put in first class condition and she then resumed the lighthouse and buoy service on September 17.

The vessel was employed in the lighthouse and buoy service until February 5, 1910, when she was put on Hilyard's blocks at St. John, N.B., for repairs to her bottom. On March 17, she sailed for Point Prim, P.E.I., to get an automatic buoy which had drifted ashore there and remained in the buoy service until the end of the fiscal year.

##### *The 'Stanley.'*

The C.G.S. *Stanley* is a single screw steel ice-breaker built in Govan, G.B., in 1888. She is 207.8 feet long, 32.0 feet wide, 17.9 feet deep; is 394 net, 914 gross tonnage and 300 nominal horse-power.

From the first of the fiscal year until April 13, she was in the winter mail service between Georgetown and Pictou, when she was placed on the Charlottetown-Pictou route and plied regularly there until the 27th. She was in the buoy service from that date until May 13, and then was in the service of the Charlottetown Steam Navigation Company between Charlottetown and Pictou until the 19th; and after placing the buoy



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between Cape Tormentine and Tryon shoal, she left on the 23rd for Pictou and laid up there undergoing repairs and painting until September 4, when she left for Halifax, was there placed on the marine slip, had her bottom painted and was transferred from the control of the Prince Edward Island agency to that of New Brunswick.

Necessary painting and repairs being completed the *Stanley* sailed for North Sydney where, on account of unfavourable weather, she remained until December 5, when she entered on the lighthouse and buoy service in which she remained until the end of the fiscal year.

During the month of April, the *Stanley* carried 19,097 packages weighing 2,097,670 pounds, freight, \$1,475, carried 660 passengers, fares, \$834, furnished 259 meals to passengers, \$25.90, furnished 110 berths to passengers, \$110.82. Total earnings for the month, \$2,445.82.

## BRITISH COLUMBIA DISTRICT.

*The 'Quadra.'*

The *Quadra* is a screw steel vessel built in Paisley, Scotland, in 1891. She is 174.5 feet long, 31.1 feet wide, 13.6 feet deep; 265 net, 573 gross tonnage and 120 horse-power.

This steamer is in the light and buoy service of the British Columbia agency of this department. She left Victoria for Carmanah station on April 18, also with building material and workmen for stations on the west coast of Vancouver island. She landed supplies at stations in the Gulf of Georgia, proceeded to Port Simpson, landing supplies enroute and placed a new buoy off Kitson bank and marking the entrance of Porpoise harbour. She was under the direction of the district engineer from June 8 to 29, and carried workmen and construction material to Race Rock, Carmanah, Triangle island and to the west coast trails, then delivered supplies to stations in the Gulf of Georgia, Pachena and Cape Beale and was placed at the disposal of His Excellency the Governor General for his trip to Alaska, on August 5, which service she performed until September 13.

She was engaged until November 6, conveying construction supplies to wireless telegraph stations at Deluge point and Triangle island, and in placing a gas beacon on Copper island.

From November 6 to 25, she was on an inspection trip and on her return to Victoria resumed the wireless stations construction service.

Wireless stations at Triangle island and Prince Rupert were supplied with construction materials, Vancouver rock and Dall patch gas buoys were relieved, and 'wireless' construction men were transferred from Triangle island to Prince Rupert.

*The 'Newington.'*

The *Newington* is a screw, iron vessel built in Hull, G.B., in 1889, and purchased by the department in 1908. She is 115.3 feet long, 21 wide, 11.5 deep; 61 net, 93 gross tonnage and fifty-eight horse-power.

This steamer is employed in the light and buoy service of the British Columbia agency of this department.



*The 'Maude.'*

The *Maude* was chartered for the months of November and December to deliver oil and supplies to the gulf stations and was under the control of the British Columbia agency.

*The 'Leebro.'*

The *Leebro* was chartered from May 10, 1909 to January 19, 1910, by the British Columbia agency of this department and was during that time in the maintenance and construction services.

*The 'William Jolliff.'*

The *William Jolliff* was chartered by the British Columbia agency of this department from July 10 until October 1, to take the place of the *Quadra* while the latter was put at the disposal of His Excellency, the Governor General and party.

## MONTREAL DISTRICT.

*The 'Maisonneuve.'*

The *Maisonneuve* is a wooden, screw steamer, built at Smith's Falls, Ontario, in 1894, and was first called the *Gladys*. She is 75.7 feet long, 9.7 wide, and 7.3 deep; 18 net, 26 gross tonnage, and nine horse-power.

She is engaged in the lighthouse and buoy service of the Montreal agency of the Department of Marine and Fisheries. She began the season's operations on May 20, and from that date until June 10, was engaged in the inspection of the aids to navigation on the Ottawa river.

Between June 22 and July 18, the *Maisonneuve* was commissioned to do special service on Lake Champlain in connection with the Tercentenary celebration.

On her return, she resumed her usual services on the Ottawa and Rideau rivers until the close of navigation.

*The 'Shamrock.'*

The *Shamrock* is a single screw wooden vessel, built in Quebec in 1898. She is 117.3 feet long, 25 feet wide, and 9.7 feet deep; 161 net, 237 gross tonnage and sixty-one nominal horse-power.

She is employed in the lighthouse and buoy service of the Montreal agency of the department.

*The 'Lady Grey.'*

The *Lady Grey* is a twin-screw steel vessel, built at Barrow, G.B., in 1906. She is 172 feet long, 32.2 feet wide, 15.9 deep; 65 net, 733 gross tonnage and 353 nominal horse-power. She is fitted with sweeping apparatus for ship-channel work and two 12-inch pumps, each of which has a capacity of 2,500 gallons per minute.

She was employed during the year in the ship channel and ice-breaking services, on the St. Lawrence route.

*The 'Alpha.'*

The *Alpha* is a single screw wooden vessel built at Lévis, P.Q., in 1900. She is 47.5 feet long, 12.2 wide, 4.9 feet deep; 7 net, 20 gross tonnage.



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*The 'Hosanna.'*

The *Hosanna* is a single screw wooden vessel, built at Sorel, P.Q., in 1893. She is 53.6 feet long, 23 feet wide, 6 feet deep; 59 net, 89 gross tonnage and nineteen horse-power. She is in the lighthouse and buoy service on the St. Lawrence river.

## PRINCE EDWARD ISLAND DISTRICT.

*The 'Earl Grey.'*

1910

The *Earl Grey* is a new steel ice-breaker, specially designed for navigating the Strait of Northumberland in winter, to keep up steam communication between Prince Edward Island and the mainland.

She was built in 1909, at Barrow in Furness, G.B., by Vickers Sons & Maxim, and designed by Mr. Charles Duguid, Marine architect of the Department of Marine and Fisheries, and is 250.0 feet long, 47.7 feet wide, and 24.1 feet deep. Her tonnage is 2,357 gross and 930 tons net, with a displacement of 3,340 tons.

She is fitted with two double ended and two single ended boilers, each allowed a pressure of 180 pounds to the square inch, triple expansion engine of 800 nominal or 6,500 indicated horse-power, water ballast space of 101.11 tons, divided into nine water ballast tanks of the latest type and holding in all 739½ tons weight of water; five bulk-heads with water doors and wireless telegraphy. She is classed at Lloyds 100A1.

The *Earl Grey* is fitted up in a superior manner as a passenger and freight boat. The accommodations for first class passengers being superior to the best passenger boats in the British isles.

The deckhouses on the promenade deck contain the first class passenger saloon, smoke room, official cabins and combined wireless telegraphy room and operators' cabin.

The deckhouses on the upper deck contain forward, dining saloon, entrance, pantry and cabin for stepward and purser and aft, mail room with cabin and store room adjoining.

The first class passengers' saloon on the promenade deck is finished in hardwood panelled, ceiling finished in pine, painted white and tastefully decorated. The sofa seats are upholstered in velvet plush of the first quality and the floor laid with pile carpet of fine quality. Mahogany chairs, sofas of handsome design, piano, tables and book cases form part of the furnishings of this saloon.

The entrance to the saloon is finished in a similar manner to the saloon and has black and white India rubber tiling; the stairway treads are also India rubber with brass nosings.

The smoking room is aft, it is panelled in the same manner and the seats are upholstered in leather.

First class state rooms are finished in enameled white. They are fitted up for one, two, three and four persons, and iron berths and sofas with hinged backs. The berths are all of sufficient size for comfort.

The main dining saloon is on the upper deck and has accommodation for sixty persons. The wood work is finished in hardwood panelling on the sides, and the ceiling is pine painted white picked out with gold ornamentation. The tables and sideboard are of mahogany and the chairs are upholstered in leather.



1 GEORGE V., A. 1911

An extra suite of rooms has been provided and these are handsomely decorated. The day cabin has been finished in a manner similar to the other finish of first class quarters, and the sleeping cabin provided with a comfortable arrangement of berths, similar to the stateroom berths.

There are also official day cabins and official sleeping cabins fitted up and furnished in first class style. The rooms of the engineers, mail clerks, and Marconi wireless telegraph clerks are fitted up similarly to the officers' quarters.

The captain's day and sleeping cabin, pilot and officers' quarters are located in the deckhouse on the bridge deck. The chief engineer's room is fitted in a similar manner to the captain's cabin.

In addition to first class accommodation, furniture and general fittings, second class accommodation has been provided for passengers who pay a second class fare. The vessel has sleeping accommodation for fifty-five first class, and twenty second class passengers, and accommodation for sixty-eight of a crew, including officers, engineers, &c.

The quarters of the crew, firemen and oilers are situated forward and are provided with hammocks. There are also wash rooms and other accommodation for the men.

The steamer is heated throughout by steam, supplied from one of the main boilers passing through a main branch pipe making a complete circuit of the vessel. From the main pipe, special branches are carried to all compartments, with a valve at the point where the pipe enters and one where it leaves the compartment. All steam heating pipes are made of copper, steam jets are fitted for the heating of water in the bath, galley, pantry, &c. The cabins and saloons are heated by a single pipe 1½-inch in diameter at a suitable distance from the floor.

Fresh water service has been amply provided for by a system of pipes to all cabins, saloons, galley, pantry, baths and lavatories, and natural ventilation to all parts of the vessel forms a part of her very complete arrangement.

She is lighted throughout by electric light; the first class quarters, particularly the saloons, have incandescent lamps of sixteen candle-power inclosed in ground glass globes, while lamps of less candle-power are placed in some of the small apartments. She has also a search light.

The vessel has steam steering gear as well as an efficient hand steering gear.

The speed of the *Earl Grey* is seventeen knots an hour, a higher speed having been made in part of her run at her trial trip.

The cargo space is 'tween' decks with cargo ports 6 feet 6 inches square forward, and 6 feet 6 inches by 6 feet aft. The vessel is constructed to carry 600 tons dead weight on a draught not exceeding 18 feet, 500 tons of coal in her bunkers and water ballast in addition.

The *Earl Grey* is equipped with one hundred and sixty life belts and six life buoys, three life boats to carry one hundred and twelve people and three ship-boats to carry fifty-six people.

The vessel throughout is built exceptionally strong, being specially designed for ice-breaking and winter navigation, exceeding in many respects Lloyd's requirements; her machinery and equipment are according to the latest practice in the British isles for the construction of vessels. Her equipment, appointments, apparel, furniture, and



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finish are in all respects superior to the best channel passenger boats in Great Britain. Her total cost was \$501,266.

The *Earn Grey* began the winter service on December 30, 1909, between Charlottetown and Pictou, ran until January 18, 1910, then went on the Georgetown and Pictou route from that date till January 25. She was on the Charlottetown-Pictou route from January 25 till February 18, when the vessel went to Georgetown on account of a snow storm. From February 18 until the opening of spring navigation, she remained on the Charlottetown-Pictou route. She rendered good service, only missing two trips and that on account of bad weather.

She made 39 trips, carried 81,593 packages of freight, weighing 8,136,385 pounds, 4,680.19 tons.

Her earnings were:

Receipts, freight...	\$6,044 74
“ passengers, 1,493 F.C., 870 S.C...	3,043 00
“ berths, 711...	711 00
“ meals, 953 supplied by contract...	95 30
<hr/>	
Total earnings...	\$9,894 04

*The ‘Minto.’*

The *Minto* is a single screw vessel specially designed for ice-breaking. She was built in Dundee, Scotland, in 1899, and is 225 feet long, 32.7 feet wide, 18.0 feet deep, 372 net, 1,090 gross tonnage and 216 nominal horse-power, 2,900 indicated.

The *Minto* continued on the Georgetown-Pictou route until April 14, 1909, and then made her trips between Charlottetown and Pictou up to April 24. The vessel then entered upon the Marconi wireless telegraph service and was engaged until May 15, when she was laid up in Charlottetown. On June 5, she again entered the wireless telegraph service and remained in that service until June 21, when she again laid up at Charlottetown for overhaul of machinery. A thorough overhaul was given and repairs made to machinery and equipment during the time she laid at Charlottetown. She left the last mentioned port for Halifax on September 18, and was put on the marine slip for rivetting and painting the bottom of the vessel. She returned to Charlottetown and laid up until November 24, when she left to engage in the wireless telegraph service taking on board the operators from the outlying gulf stations, returned to Charlottetown on December 4 and left for Summerside on December 15, to take up the winter service on the withdrawal of the summer steamers.

She began the winter service on December 29, when she made a trip from Summerside to Cape Tormentine. On December 31, she went on the Charlottetown-Pictou route, where she plied regularly until January 4. From that date until February 3, she was on the Georgetown-Pictou route, and went again to the Georgetown-Pictou route on February 12.

She returned to Charlottetown on the 8th, went to Georgetown on the 12th, and from there sailed to the Magdalen islands, returning to Georgetown on March 14. From the 16th until the close of the fiscal year, she plied between Charlottetown and Pictou.



1 GEORGE V., A. 1911

She was unusually successful during the last season, being detained only on January 11 and 26.

The *Minto* made forty-one round trips and one round trip to Magdalen islands. She carried 44,307 packages freight weighing 4,729,610 pounds or 2,364.4 tons.

Her earnings were:—

Receipts, freight.. . . .	\$3,362 63
“ passengers, 1,296 F.C., 453 S.C.. . . .	2,436 25
“ meals supplied by contract.. . . .	61 50
“ berths.. . . .	335 00
<hr/>	
Total earnings.. . . .	\$6,195 38

*The ‘Brant.’*

The *Brant* is a wooden vessel built at Charlottetown, Prince Edward Island, in 1899. She is 100.4 feet long, 19.1 feet wide, 8.5 feet deep; 58 net and 142 gross tonnage and thirty-three horse-power.

The vessel was in winter quarters at Charlottetown during 1908-9, and shipped her crew for painting and cleaning on April 16, 1909. She proceeded to place buoys in Charlottetown harbour for the buoy contractor on April 27. The vessel continued in the lighthouse supply and buoy service around the coast of Prince Edward Island and was also employed in conveying and placing large buoys at Magdalen Islands, and in towing a dismasted schooner from Pownal to Charlottetown, and in towing the dredge *Prince Edward* from Charlottetown to Souris. The vessel continued in the lighthouse and buoy service attending large and automatic gas buoys until late in the season and went into winter quarters on December 31. Her machinery was thoroughly overhauled and repaired in March, 1910, at Charlottetown.

UPPER ST. LAWRENCE RIVER AND GREAT LAKES.

*The ‘Simcoe.’*

The *Simcoe* is a steel, twin screw vessel of 217 horse-power. She was built by Swan, Hunter and Wingham, Richardson, Limited, Wallsend-on-Tyne, England, and launched in 1909; is 180 feet long, 35.2 feet wide, 15.2 deep, 193.8 net, 437.63 gross tonnage.

She is employed in the lighthouse and buoy service on the Great Lakes and Georgian Bay.

*The ‘Scout.’*

The *Scout* is a wooden, single screw vessel of twenty-seven nominal horse-power, built in Cardinal, Ontario, in 1900. She is 103.6 feet long, 25.6 feet wide, 9.2 feet deep, 70 net and 176 gross tonnage. She is fitted with powerful search and electric lights and was used in the buoy service between Montreal and Kingston during the fiscal year.

*The ‘Reserve.’*

The *Reserve* is a screw, wooden vessel, built in Buffalo, N.Y., in 1884. She is 61.8 feet long, 15.3 feet wide, 4.8 feet deep, 36 net, 49 gross tonnage and thirty horse-power. She is engaged in sweeping the channel, towing and attending the buoys under the control of the lighthouse depot, Prescott.



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*The 'Lambton.'*

The *Lambton* is a steel, single screw vessel of eighty-nine horse-power, hull built at the government shipyards, Sorel, P.Q., in 1908-9. She is 108 feet long, 25.1 feet wide, 12.7 feet deep, 323 gross and 182 net tonnage.

Her engines are triple expansion, inverted, direct acting, with working pressure of 170 pounds to the square inch, and built by Flemming and Ferguson, Limited, Paisley, Scotland.

She is in the lighthouse construction and superintendence service of this department.

## HYDROGRAPHIC STEAMERS.

*'La Canadienne.'*

*La Canadienne* is a single screw, iron vessel, built in Glasgow, Scotland, in 1880. She is 154.3 feet long, 22.7 wide, 10.9 deep, 227 net, 372 gross tonnage, and sixty horse-power.

She is in the hydrographic service of the Department of Marine and Fisheries, and spent the last season above Rimouski, P.Q., in charge of Commander Irving Mills, with Captain H. J. McGough as sailing master.

She was laid up at the Louise basin, repaired and outfitted and supplied by the Quebec agency.

*The 'Bayfield.'*

The *Bayfield* is a steel screw vessel built in Meadowside, Patrick, G.B., in 1889. She is 140 feet long, 24.1 feet wide, 11.3 feet deep, 86 net, 276 gross tonnage and 160 horse-power. This vessel was first named the *Lord Stanley*; she was afterwards purchased from Messrs. Geo. Davie & Sons of Lévis, Quebec. She was overhauled and alterations made, and then named the *Bayfield*.

She was engaged in the hydrographic survey on the great lakes during the year.

*The 'Lillooet.'*

The *Lillooet* is a twin screw, steel steamer, 170 feet long, 27 beam, 15 feet deep, and has a displacement of 760 tons with 800 indicated horse-power. She is employed in the hydrographic survey in British Columbia and was built at Esquimalt, B.C., by Messrs. Bullen, and equipped with the latest devices for this service.

*The 'Cartier.'*

The *Cartier* is now under construction to replace the *La Canadienne*. It is expected that this new steamer being built in Great Britain will be ready to enter upon the hydrographic work during the season of 1910.

*The 'Gulnare.'*

The *Gulnare* is a screw steel vessel, 137 feet long, 20.5 feet wide, 13.6 feet deep, 106 net, 362 gross tonnage and sixty-four horse-power. She was built at Scotsoun, Glasgow, Scotland, in 1893, and is employed in the tidal survey service of this department on the east coast, but was employed by the Nova Scotia agency in other work during the months of June, July, September and October.



## FISHERY PROTECTION CRUISERS.

*The 'Princess.'*

The *Princess* is a steel single screw vessel, built in Grangemouth, G.B., in 1896. She is 165 feet long, 26 feet wide, 17.7 deep, 252 net, 542 gross tonnage, and ninety horse-power.

She is engaged in the fishery protection service in the Gulf and River St. Lawrence, commanded by Dr. W. Wakeham, with Joseph Chalifour as sailing master.

After the close of her regular service, she was used for a trip to the Straits of Belle Isle to return labourers sent to construct towers and lights there.

She wintered in Louise basin, Quebec. She was thoroughly repaired by the Quebec agency, under whose direction she operates when not in the fishery protection service.

*The 'Curlew.'*

The *Curlew* is a steel screw steamer 116.3 feet long, 19.8 feet wide, 11.3 feet deep, 96 net, 158 gross tonnage and fifty horse-power. She is engaged in the fishery protection service in the New Brunswick agency, of the Department of Marine and Fisheries.

*The 'Petrel.'*

The *Petrel* is a steel, screw vessel, built at Owen Sound, Ont., in 1892. She is 116 feet long, 22 feet wide, 10.3 feet deep, 98 net, 192 gross tonnage and fifty nominal horse-power.

She is engaged in the fishery protection service in the waters of the maritime provinces.

*The 'Canada.'*

The *Canada* is a steel, screw steamer built in Barrow-in-Furness, in 1904. She is 206 feet long, 25.1 feet wide, 13.3 feet deep, 136 net, 411 gross tonnage, and 209 horse-power.

She is employed in the fishery protection service in the waters of the maritime provinces.

*The 'Kestrel.'*

The *Kestrel* is a screw, wooden vessel built at Vancouver, B.C., in 1903, by the Wallace Shipbuilding Company. She is 126 feet long, 24 feet wide, 12.2 feet deep, 188 net, 311 gross tonnage and fifty-nine nominal horse-power.

She is engaged in fishery protection in the British Columbia waters.

*The 'Falcon.'*

The *Falcon* is a screw, wooden steamer, built at Port Moody, B.C., in 1902, and was formerly called the *Ruth*. She is 70.7 feet long, 17.8 wide, 7.4 deep, 48 net, 71 gross tonnage and fourteen nominal horse-power.

She is engaged in the fishery protection of British Columbia waters.

*The 'Georgia.'*

The *Georgia* is a wooden, screw vessel built at Victoria, British Columbia, in 1900. She is 60 feet long, 11.3 feet wide, and 5 feet deep, 23 net, 34 gross tonnage and twelve nominal horse-power.

She is in the fisheries protection of British Columbia waters.



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*The 'Vigilant.'*

The *Vigilant* is a steel, screw steamer built in Toronto, Ont., in 1904. She is 177 feet long, 22.1 feet wide, 13.2 feet deep, 243 net, 396 gross tonnage and sixty-five horse-power.

She is engaged in the fishery protection service in Ontario waters.

*The 'Constance.'*

The *Constance* is a composite single screw steamer, 115.6 feet long, 19.6 feet wide, 11.2 feet deep, 126 net, 185 gross tonnage and fifty nominal horse-power. She was built at Owen Sound by the Polson Iron Works in 1891.

She is engaged in the fishery protection service in eastern waters.

*The 'Lady of the Lake.'*

The *Lady of the Lake* is a single screw wooden vessel, built at Selkirk, Manitoba, in 1897. She is 105 feet long, 18.5 wide, 8.9 feet deep, 155 net, 201 gross tonnage and thirteen nominal horse-power. She is employed in the fishery service on Lake Winnipeg.

*The 'Alcedo.'*

The *Alcedo* is a single screw vessel built at Ballard, Wash., U.S.A., in 1905. She is 69.7 feet long, 16.8 feet wide, 7.6 feet deep, 47 net, 70 gross tonnage and sixteen nominal horse-power. She is employed in fishery protection on the Pacific coast.

*The 'Restless.'*

The *Restless* is a single screw wooden vessel, built at New Westminster, B.C., in 1906. She is 71 feet long, 17 feet wide, 7 feet deep, 53 net, 76 gross tonnage and sixteen nominal horse-power.

She is engaged in fishery protection on the Pacific coast.

*The 'Hudson.'*

The *Hudson* is a single screw wooden vessel, built at St. John, N.B., in 1903. She is 57.7 feet long, 12.5 feet wide, 4.7 feet deep, 23 net, 34 gross tonnage and seven nominal horse-power.

She is employed in the fishery service in New Brunswick waters.

*The 'Ostrea.'*

The *Ostrea* is a single screw wooden vessel built in Charlottetown, P.E.I., in 1902. She is 50 feet long, 13 feet wide and 4.5 deep; and is employed in the oyster culture service in Prince Edward Island waters.

*The 'Nelson.'*

The *Nelson* is a wooden steam vessel, 64 feet long, 13.8 feet in breadth and 6.6 feet deep, gross tonnage 19.46, horse-power 8.16 nominal.

This small vessel is engaged in the fishery service in the Nova Scotia district.

*The 'Thirty-three.'*

The *Thirty-three* is a steel boat, length 80 feet, beam 18.1 feet, depth moulded 8.3 feet, gross tonnage 79 tons, net 33 tons, indicated horse-power 160.

This steamer is employed in the fishery service in Nova Scotia.



## REPORT OF ICE BOATS AT CAPE TRAVERSE, PRINCE EDWARD ISLAND AND CAPE TORMENTINE, NEW BRUNSWICK.

The ice boats were not required during the winter of 1909-10 on account of continuous communication by the two ice-breakers—the *Earl Grey* and *Minto*.

There are nine ice boats in the boat house at Cape Tormentine which need repairs. Seven ice boats have been repaired at Cape Traverse and put in first class order, which makes nine old boats in good repair and three new ones. Total ice boats at both capes, 21.

### BUOYS AND BEACONS.

The buoys and beacons were maintained by the departmental steamers and by contractors and some additions made to the number in the different districts and provinces. The buoys added, consisted of various types and kinds and are known as gas buoys, gas and whistling, gas and bell, whistling, bell buoys, steel can and conical, spar and platform buoys. These kinds comprise nearly all the types of buoys used in Canadian waters, the others being wooden can and conical and barrel buoys. The highest types of buoys are the combined gas and whistling, combined gas and bell and gas buoy, the last is not an alarm buoy. Automatic whistling and automatic bell buoys without lights follow the lighted buoys in importance and cost.

The substitution of lighted buoys for unlighted ones, has taken place in several districts and many changes have been made with a view of improving the buoy service. The result has been for the year past a more efficient buoy service than formerly.

The agents of the department have reported in detail upon the work of maintaining the service, and have enumerated the changes made and the localities marked by new buoys.

The work performed by departmental steamers, while carrying out the buoy service, has also been detailed in the reports, the means employed and the dates specified at which the buoys were placed and raised.

The reports of harbour masters and others, who superintend the buoy contracts in various localities throughout the provinces, were received in connection with the accounts due contractors. These reports form part of the records of the department.

Complaints that were made regarding the absence or displacement of these aids received consideration, and agents, inspectors, harbour masters and contractors were given instructions to replace the buoys. Although the department has increased the number of steamers which now include in their work buoy service, yet it is not always possible to promptly restore buoys which are removed by storms or displaced by vessels and rafts in tow. Carelessness on the part of those in control of vessels is responsible for the removal of buoys in too many instances, and the department is often unjustly blamed for this state of affairs and delay in replacing the buoys. It is admitted, however, that in many cases the inspectors of contract buoys and contractors themselves, neglect to act as promptly as the importance of the service demands. The system of payment of harbour masters by fees on vessels entering a port, whose duty it is to inspect the buoy service, offers no inducement, in a great number of instances to perform in-



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spection as the fees amount to very little in a large number of harbours. A better system of inspection would, doubtless, improve the contract service, but the cost would be very large and increase the expenditure for buoy service, which has already rapidly increased owing to the large number of expensive buoys placed in recent years, in our most frequented water ways. It should be remembered also, that there is no taxation on shipping for the buoy service and the cost of increase in number and improvement in this branch, is borne by the taxpayer and not specially by ship owners and mariners.

The details of the work done during the fiscal year 1909-10, and the number of buoys placed and maintained in position by the departmental steamers, will be found in Appendix No. 2 of this report. Inclosure No. 1 contains a statement by provinces of new warning or alarm buoys placed and improvements during the year; inclosure 2, contains a statement by provinces of warning buoys in service during the fiscal year; inclosure 3, is a statement by divisions of the number of gas buoys in service; inclosure 4, is a complete statement of gas buoys in operation throughout the Dominion.

The following list contains the number of buoys in different localities maintained under contract, or arrangement with harbour masters. The contract system by tender is no doubt the most economical with regard to cost, but the buoys are not always as satisfactory as those made and placed by the department.

In the St. Lawrence river between Montreal and Platon, a distance of 125 miles, the buoys were maintained under the Montreal agency and consisted of 66 gas buoys, 31 iron and 164 wooden spar buoys. The gas buoys were in operation from April 23 to November 28. Inspection of the whole distance was made weekly and at times oftener.

The total expenditure for buoy service for the Dominion for the fiscal year was \$150,150.67, and by provinces as follows:—

Nova Scotia.. . . .	\$ 16,005 01
New Brunswick.. . . .	18,905 43
Quebec, including Montreal agency.. . . .	70,524 87
Ontario.. . . .	13,387 12
British Columbia.. . . .	27,549 93
Prince Edward Island.. . . .	3,778 31
<hr/>	
Total.. . . .	\$150,150 67



List of Buoys maintained by the Department of Marine and Fisheries in Canadian Waters in 1909.

ONTARIO.

	No. of Buoys.		No. of Buoys.
Amherstburg, including Bois Blanc..	38	Orillia..	18
Bay of Quinte (two contracts)..Govt. Str.		Parry Sound..	Govt. Str.
Bears Rump..	1	Pembroke..	23
Big Duck island, bell buoy..	1	Pointe au Baril, beacons, 15..	2
Blind river..	4	Pointe au Baril, buoys..	6
Byng inlet..	7	Penetanguishene..	10
Campbell rock..	1	River Thames, buoys..	8
Collingwood..	15	Rondeau..	6
Clapperton channel, 1 beacon and..	9	Sault Ste. Marie..	21
Georgian bay..	13	Sault Ste. Marie, canal approaches..	25
Green shoal, Govt. Str..	1	Sault Ste. Marie, gas buoys..	5
Goderich..	4	Seine river and Grassey lake, piles..	30
Hawkesbury..	Govt. Str.	Seine river, buoys..	10
Kaministiquia..	9	South Baymouth..	4
Lake Erie, gas buoys..	4	Stokes bay..	6
Lake of the Woods, including bell buoy..	137	Sturgeon bar, gas buoy..	1
Lake Simcoe..	5	Saugeen river..	9
Lake Superior, including bell buoy..	8	Sturgeon river..	26
Little Current..	8	St. Clair river, gas buoy..	1
Lone Rock, gas and bell buoy..	1	Sarnia, gas buoy..	1
Lake Timiskaming..	3	Southampton, gas buoy..	1
Midland..	6	Timagami lake, 4 beacons and..	31
Murray Canal and Presqu'île bay..	23	Trenton..	Govt. Str.
Napanee..	14	Victoria island, Lake Superior..	3
Niagara, bell buoy..	1	Waubashene..	37
North Sisters rock..	4	Winnipeg river..	13

QUEBEC.

Amherst harbour..	8	Little river east..	1
Anse à Gascons..	1	Little river west..	1
Anse à Beaufile..	1	Lachine rapids..	7
Barachois de Malbaie..	1	Maria..	1
Bonaventure..	9	Matane..	3
Cap Chat..	1	Mont Louis..	1
Cape Cove..	1	New Richmond..	3
Cap Meule..	1	North channel, Island of Orleans..	11
Carleton point..	1	Nouvelle..	2
Chicoutimi..	15	Paspébiac..	1
Cock point..	1	Pentecost..	1
Chaudière basin..	7	Percé..	2
Cape Despair..	1	Port Daniel..	1
Douthes point..	1	Portneuf..	9
English bay..	3	Restigouche river..	10
Eschourie rock..	1	Restigouche river, gas buoys..	6
Fox river..	1	Richelieu river, balises..	
Gaspé..	6	Petit Rocher..	2
Grand Entry..	17	Richelieu river, St. Antoine to Chambly	35
Griffin cove..	1	Richelieu river, above St. Johns..	21
Gros Cap-aux-Os..	1	Rigaud river..	7
House harbour, Magdalen islands..	7	Rivière à la Pipe, Lake St. John..	8
Lake Temiskaming, viz:—		Rivière des Prairies..	10
Opemigon narrows..	4	Ste. Adelaide de Pabos..	1
Montreal river..	3	Ste. Anne river..	1
North Temiskaming, bushes and..	9	St. Michel..	4
Couvrettes camp..	1	St. Thomas..	8
Browns point..	1	St. Godfroy..	1
Ville Marie channel bushes..		St. Lawrence river, between Platon and Montreal, gas buoys..	66
Lake St. John—		St. Lawrence river, between Platon and Montreal, unlighted buoys..	195
River Ashapmuchuan..		Serpent reef..	
River Mistassini..		St. Placide, in charge of Govt. Str....	52
River Peribonka..			
Roberval harbour..			
including beacons..	115		



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List of Buoys maintained by the Department of Marine and Fisheries, &c.—*Con.*QUEBEC—*Con.*

	No. of Buoys.		No. of Buoys.
Maintained by Quebec agency, gas-buoys including combined.. . . .	33	Maintained by Quebec agency below Quebec, bell-buoy.. . . .	1
Maintained by Quebec agency, unlighted buoys, can and conical.. . .	44	Maintained by Quebec agency below Quebec, whistling-buoy.. . . .	1

## NEW BRUNSWICK.

Bathurst.. . . .	26	Miscou.. . . .	9
Baie Verte and Port Elgin.. . . .	36	Musquash.. . . .	7
Bay du Vin.. . . .	13	Neguaç.. . . .	21
Beaver and Blacks harbour.. . . .	9	Neil harbour.. . . .	1
Black brook, Miramichi river.. . .	3	Napan river, 24 stakes and.. . . .	3
Blak Land gully.. . . .	12	Northwest arm, Miramichi.. . . .	10
Buctouche, 34 stakes and.. . . .	22	Northeast arm, 24 stakes and.. . .	8
Buctouche river, bushes and buoys..	260	Ox island, St. John river.. . . .	5
Bartibogue, 12 bushes, 1 spar.. . .	1	Petit Rocher.. . . .	2
Campobello.. . . .	10	Pisarinco.. . . .	2
Caraquet.. . . .	15	Pokemouche, number of bushes and..	7
Cocagne, stakes, 30 and.. . . .	11	Quaco (maintained by C. G. S.).. . .	3
Dalhousie and Restigouche.. . . .	10	Richibucto and Albion.. . . .	33
Digdequash.. . . .	5	Richibucto, Rexton and Browns yard.	30
Dipper harbour.. . . .	3	Salmon river.. . . .	15
Dorchester.. . . .	3	Shediac.. . . .	18
Grande Anse.. . . .	4	Shediac, North of island, 20 bushes and	2
Grand Lake.. . . .	32	Shippigan, 17 pickets, 14 bushes and..	20
Grand Manan, 1 spindle and.. . . .	28	St. Andrews.. . . .	15
Great Shemogue.. . . .	7	Ste. Croix ledge, maintained by C.G.S.	11
Hatfield point, bushes.. . . .	..	St. John river.. . . .	76
Harvey.. . . .	7	St. Louis, 35 bushes and 8 lamps.. .	2
Hopewell cape.. . . .	1	St. Simon bay Caraquet.. . . .	4
Kouchibouguac and Black river, bushes	..	Tabusintac.. . . .	20
Little Aldouane, 25 bushes and.. . .	5	Tracadie, South Gully, 30 bushes and..	5
Lepreau.. . . .	3	Tracadie, 100 bushes, North Gully.. .	11
Letite and Back bay, 1 spindle and..	14	Tynemouth creek.. . . .	3
Little Shemogue, 1 beacon and.. . .	5	Washademoak, 144 bushes and.. . .	2
Little Shippigan.. . . .	12	Waweig river.. . . .	2
Magaguadavic.. . . .	13	West Isles, 4 spindles and.. . . .	23
Maquapit and French lakes, 20 stakes	..	Whistling, gas, bell, can and conical	..
and.. . . .	4	buoys are maintained by C. G.	..
Miramichi, 9 winter buoys, 1 lightship	..	steamers.	..
and.. . . .	22		

## PRINCE EDWARD ISLAND.

Bay Fortune.. . . .	3	Miminegash.. . . .	6
Beach point.. . . .	3	Montague.. . . .	9
Bedeque.. . . .	11	Murray harbour.. . . .	42
Belle river.. . . .	1	New London, stakes and.. . . .	9
Brae harbour.. . . .	5	Orwell and Vernon river, 36 bushes..	6
Brudenell river.. . . .	4	Pinette, number of bushes and.. . .	5
Cardigan, Lower, 7 summer and 2	..	Port Hill.. . . .	12
winter buoys.. . . .	7	Pownal.. . . .	7
Cardigan, Upper.. . . .	20	Rollo bay.. . . .	3
Cascumpec, 12 stakes.. . . .	14	Rustico.. . . .	5
Charlottetown, 20 stakes.. . . .	21	Savage harbour.. . . .	2
Covehead.. . . .	3	Souris.. . . .	6
Crapaud stakes and.. . . .	6	St. Peters harbour.. . . .	10
East river (Hillsboro').. . . .	17	Summerside.. . . .	10
Egmont bay.. . . .	12	Tignish.. . . .	4
Egmont south, 8 stakes and.. . . .	2	Tracadie.. . . .	7
Georgetown.. . . .	14	West point.. . . .	1
Goose harbour.. . . .	2	Wood island.. . . .	4
Grand river, 1 beacon and.. . . .	12	Maintained by agency (signal buoys).	4
Grand river, lot 14.. . . .	8	Maintained by agency (conical and can)	8
Indian rocks.. . . .	1	Maintained by agency (gas and whistl-	..
Little channel.. . . .	1	ing buoys.. . . .	5
Malpeque.. . . .	16	Zephir rock (N.B. waters) gas only..	1



LIST of Buoys maintained by the Department of Marine and Fisheries, &c.—*Con.*

NOVA SCOTIA.			
	No. of Buoys.		No. of Buoys.
Advocate harbour.. . . . .	6	Northport.. . . . .	11
Apple river.. . . . .	8	North Sydney.. . . . .	5
Arichat.. . . . .	20	Neils harbour.. . . . .	1
Argyle river and sound.. . . . .	9	Parrsboro'.. . . . .	6
Avon river.. . . . .	6	Petit de gras, 6 winter buoys and.. . . . .	14
Amherst basin.. . . . .	4	Pictou.. . . . .	6
Barrington.. . . . .	36	Popes harbour.. . . . .	1
Bear river.. . . . .	17	Port Félix.. . . . .	11
Beaver harbour, 8 winter buoys and.. . . . .	8	Port Hood.. . . . .	7
Blandford.. . . . .	5	Port Le Tour.. . . . .	15
Bridgewater.. . . . .	10	Port Medway, Govt. Str.. . . . .	9
Brule.. . . . .	5	Port Phillip.. . . . .	12
Canning or Habitant river.. . . . .	6	Port Morien.. . . . .	2
Canso and St. Andrew passage, 28 winter buoys and.. . . . .	31	Port L'Hébert.. . . . .	12
Cape Negro or Northeast harbour.. . . . .	17	Pubnico.. . . . .	18
Cariboo.. . . . .	6	Pugwash.. . . . .	9
Chester.. . . . .	25	Prospect Lower.. . . . .	10
Cheticamp.. . . . .	12	Port Mouton.. . . . .	9
Chezzetcook and Petpiswick.. . . . .	6	Port Bickerton, 3 winter buoys and.. . . . .	5
Christmas island and Barra strait.. . . . .	11	Pennant harbour.. . . . .	8
Clarks cove, West bay.. . . . .	3	Pringles harbour.. . . . .	4
Clarks harbour.. . . . .	17	River John (stakes).. . . . .	3
Cockerwit pass and Woods harbour....	20	Roseway.. . . . .	3
Cooks cove, Toby cove.. . . . .	4	St. Anns.. . . . .	5
Calf island bay.. . . . .	5	St. Mary river, winter buoys and.. . . . .	9
Crow harbour.. . . . .	3	St. Mary river, up to Sherbrooke, 5 winter buoys and.. . . . .	18
D'Escousse and Lennox passage.. . . . .	28	St. Peters bay, 4 winter buoys and.. . . . .	16
Digby and Annapolis, 5 winter buoys.	15	St. Peters inlet.. . . . .	10
Dover.. . . . .	4	Sambro.. . . . .	12
East Dover.. . . . .	3	Shag harbour.. . . . .	15
East bay, Bras d'Or.. . . . .	8	Sheet harbour, 5 winter buoys and....	9
Eskasoni.. . . . .	3	Shelburne.. . . . .	25
Fourchu harbour.. . . . .	11	Ship harbour, 5 winter buoys and.. . . . .	11
French Village, St. Margarets bay.. . . . .	5	Ship rock.. . . . .	1
Great Bras d'Or.. . . . .	8	Shulee.. . . . .	8
Gillis point, Boulacet.. . . . .	1	Smiths island.. . . . .	2
Guysborough.. . . . .	3	Sydney.. . . . .	2
Glace bay.. . . . .	4	Shad bay.. . . . .	3
Hay cove.. . . . .	14	Sober island to Ecum Secum.. . . . .	21
Harbour au Bouche (6 stakes).. . . . .	4	Spry bay.. . . . .	6
Ingonish, South bay.. . . . .	7	Stonev Island.. . . . .	1
Isaacs harbour, 9 white buoys and.. . . . .	12	Tangier, 7 winter buoys and.. . . . .	4
Indian harbour.. . . . .	4	Tatamagouche, 46 stakes and.. . . . .	18
Jeddore, 5 winter buoys and.. . . . .	11	Terrence bay.. . . . .	3
Jegogin.. . . . .	7	Tor bay, 8 winter buoys.. . . . .	19
Judique.. . . . .	1	Three fathom harbour.. . . . .	5
Ketch harbour.. . . . .	6	Tidnish, stakes and.. . . . .	5
L'Ardoise.. . . . .	5	Tusket (two contracts), (3 spindles).. . . . .	30
Lahave.. . . . .	12	Tancook island.. . . . .	3
Little Narrows.. . . . .	10	Upper Prospect.. . . . .	4
Little Dover.. . . . .	9	Wallace.. . . . .	15
Little Bras d'Or.. . . . .	2	West bay.. . . . .	5
Liverpool.. . . . .	3	West Dublin and Crooked channel.. . . . .	13
Lockeport.. . . . .	6	Westport.. . . . .	3
Lunenburg.. . . . .	8	Weymouth.. . . . .	13
Lunenburg, back cove.. . . . .	9	Whitehead, 5 winter buoys and.. . . . .	9
Lunenburg, middle south.. . . . .	16	West Chezzetcook.. . . . .	7
Louisburg.. . . . .	7	Yarmouth, 38 bushes and.. . . . .	12
Liscombe, 4 winter buoys and.. . . . .	6	Maintained by agency—	
Mabou.. . . . .	19	(whistling buoys).. . . . .	13
Mahone bay and Chester, Govt. Str.. . . . .	12	(bell-buoys).. . . . .	37
Main-à-Dieu.. . . . .	6	(steel conical and can-buoys).. . . . .	192
Margaree harbour.. . . . .	9	(gas-buoys).. . . . .	5
Merigomish.. . . . .	6	(combined gas and bell-buoys).. . . . .	6
Marie Joseph, 10 winter buoys and.. . . . .	13	(combined gas and whistling).. . . . .	27
Monseiller, 4 stakes and.. . . . .	6	(light vessels).. . . . .	2
McKinnon harbour.. . . . .	6	Submarine Bell signal stations.. . . . .	3
Musquodoboit.. . . . .	7	Submarine Bells attached to gas-buoys.	1
Martins brook.. . . . .	6	Walton harbour.. . . . .	1
Meteghan river.. . . . .	2		



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## LIST OF BUOYS AND BEACONS IN BRITISH COLUMBIA.

The Acetylene Beacons in the Province in operation now number 30, and have given satisfaction during the year.

They are stationed at the following places :—

Copper Island.	Walker Rock.	Dock Island.	Kelp Reef.
Helen Point.	Danger Reef.	Dodd Narrows.	Nanaimo.
Coffin Island.	White Rocks.	Ragged Ids.	Gabriola Reef.
Vancouver Nrs.	West Rock.	Maude Island.	Gillard Island.
Goose Spit.	Zero Rock.	Klewnugget.	Chatham Point.
Fog Rock.	Holland Rock.	Ridley Island.	Watson Rock.
Marked Tree.	Pointers.	Boat Bluff.	Coast Island.
Lookout Island.	Lewis Reef.		

The Acetylene Buoys in operation in the Province number 16, and are stationed at the following places :—

## 9½ Buoys.

Hodgsons Reef.	Banks Island.	Sandheads.	Kyuquot.
Vancouver Rock.	Dall Patch.	San Juan.	Skidigate.

## 8½ Buoys with bells.

Point Grey.	Comox.	Georgia Rock.
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## 8½ Buoys.

Casey Point.	Barrett Rock.	Spire Ledge.	Alford Reefs.
Haddington Reefs.			

The following list of buoys is arranged according to the waters in which the buoys are located.

Name of Buoy.	Position.	Description.
Hesquiat.....	Fairway harbour entrance .....	Whistle, steel, Black and white vert.
Half-tide rock .....	Hecate passage, Clayoquot sound.....	Platform, ball, red.
North bank.....	" " .....	" drum, black.
Vargas rock .....	" " .....	" ball, red.
Meares spit.....	Deception channel " .....	" black.
Stubbs spit.....	Stubbs Spit " .....	" "
Browning passage.....	West end of pass " .....	Spar, red and black, horizontal bands.
" .....	North shore bank " .....	Spar, black.
" .....	Middle bank " .....	" red.
Hankin rock.....	Mosquito harbour " .....	Platform, red and black, hor. bands.
Round island (north) .....	Round island bank " .....	Spar, black.
" (south).....	Templar channel bank " .....	" red.
Templar channel.....	Village island " .....	Steel, can, drum, black.
Amphitrite point.....	Carolina channel, Barkley sound ...	Whistle, steel, red.
Sutton rock.....	Ucluelet harbour " .....	Platform, red and black, hor. bands.
Rosedale rock.....	Race rocks, Juan de Fuca strait.....	Steel can, black.
Whale rock .....	Esquimalt harbour.....	Spar, red and black, horizontal bands.
Patterson rock.....	" .....	Platform, black.
Canteen .....	" .....	" red.
Channel rock .....	Victoria harbour.....	" ball, black.
Songhees rock.....	" .....	Spar, black.
Hospital rock .....	" .....	Platform, ball, black.
Johnstone reef .....	Haro strait.....	Steel can, black.
Darcy shoal.....	" .....	" "
Sidney spit (east).....	Sidney channel .....	" "
" (west).....	" .....	Steel conical red.



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Name of Buoy.	Position.	Description.
Sidney wharf (south).....	Shoal, Sidney wharf, V.I .....	Spar, red.
" (north).....	" " .....	"
Sidney rock .....	Rock " .....	Platform, red.
Colbourne passage (south)..	Colbourne passage .....	" drum, black.
" (north).....	" .....	" ball, red.
Celia reef.....	Shute passage.....	Steel conical, red.
Entrance point (Kelp rock).	Satellite channel .....	"
Batt rock .....	Ganges harbour.....	Steel can, black.
Horda rock .....	" .....	Platform, ball, black.
Benmohr rock .....	Trincomali channel.....	Steel can, red and black, horizontal bands.
Governor rock .....	" .....	Platform, ball black.
Victoria rock .....	" .....	Steel can, red and black, horizontal bands.
Virago rock.....	Porlier pass.....	Spar, black.
Porlier pass fairway .....	" .....	Bell, steel, black and white, vertical.
Grappler reef .....	Houston passage .....	Steel can, black.
Indian reef .....	Stuart channel .....	" "
False reef .....	" .....	" red and black, hor. bands.
White rock.....	Trincomali channel.....	Steel conical, red.
South east.....	False narrows .....	Spar, red.
East .....	" .....	" black.
Middle.....	" .....	" red.
West .....	" .....	" black.
Rosenfelt reef.....	Strait of Georgia.....	Steel can, cage, black.
Gossip reef .....	Active pass .....	Bell, steel, black.
Canoe pass .....	Robert bank.....	Steel can "
Sandheads .....	Channel across Sandheads .....	5 steel conical, black. 8 steel conical red.
Point Grey .....	English bay.....	Bell buoy exchanged for gas and bell.
Point Grey fairway..	Burrard inlet.....	Ball, steel, red.
First narrows .....	South side of Narrows.....	Spar, red.
Burnaby Shoal.....	Vancouver harbour.....	"
Reef point .....	Strait of Georgia.....	"
Welcome point .....	Welcome pass.....	"
Tattenham ledge.....	" .....	Spar, black.
Snake island reef....	Strait of Georgia .....	Steel conical, red.
Horswell reef.....	" .....	" "
Clarke rock.....	Inner channel.....	Platform, black.
Entrance.....	Nanaimo harbour.....	" triangle, black.
Oyster bay.....	Stuart channel.....	" black.
Boat harbour.....	" .....	Steel conical, red.
Reynolds point.....	" .....	Spar, red.
Gallows point.....	Nanaimo harbour.....	Platform, ball, red.
South channel.....	" .....	" diamond, black.
Middle Bank.....	" .....	" ball, red.
South channel (west).....	" .....	" diamond, black.
Satellite reef .....	" .....	" ball, red.
Middle bank (southwest)..	" .....	Spar, red.
" (west).....	" .....	"
Carpenter rock.....	" .....	Platform, ball, black.
Mill stream.....	" .....	" black.
Passage rock.....	Newcastle island passage.....	" "
Departure bay reef.....	Departure bay.....	" ball, red.
Dorcas rock.....	Dorcas point, V.I.....	Spar, black.
Hornby wharf reef.....	Lambert channel.....	"
Reef bluff (south).....	Baynes sound .....	Steel conical, triangle, red.
" (west).....	" .....	" red.
Village point.....	" .....	" "
Grassy point.....	" .....	Steel can, black.
Kelp bar crossing (west)...	" .....	Spar, red.
" (east).....	" .....	"
Atrevida reef.....	Malaspina strait.....	"
North reef.....	North end, Texada island.....	Spar, black.
Cortes island reef.....	Baker passage.....	Steel conical, red.
Shark spit.....	Marina island.....	" "
Whaleton rock.....	Whaleton bay.....	Spar, red.
Siwash rock.....	Johnstone strait .....	" black.



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Name of Buoy.	Position.	Description.
Ripple reef.....	Johnstone strait.....	Steel can, red and black, horizontal bands.
Swan rock.....	Addenbrooke point, Fitzhugh sound....	Spar, black.
Walbran rock.....	Fisher channel.....	Steel can, red and black, horizontal bands.
Bloxam bank .....	Telegraph passage, Skeena.....	Spar, black.
Centre bank.....	Skeena river.....	Steel nun, red.
Hazel point.....	Middle passage, Skeena.....	Spar, red.
Fairview reef.....	Prince Rupert harbour.....	Steel conical, red.
Tugwell reef.....	Metlakatla .....	Spar, black.
Harbour channel (west)....	" .....	Platform, black.
" " (east)....	" .....	"
Sparrowhawk rock.....	Cunningham passage.....	Steel can, red and black, horizontal bands.
Hankin reefs.....	" .....	Platform, red.
Dodd passage.....	Port Simpson.....	Spar, black.
Harbour reefs.....	" .....	Steel conical, red.

Spare Buoys in Stock.

8½ type gas buoys.....	7
9½ " " .....	5
11 " " .....	2
7½ " beacon.....	3
Can buoys .....	5
Conical buoys.....	3
Platform .....	2
Spar.....	1
Whistling.....	1
Bell .....	1
Total.....	29

METEOROLOGICAL SERVICE AND MAGNETIC OBSERVATIONS.

The new phases of work in connection with meteorological and magnetic observations, taken up and the extension of the field of operations has caused this service to become more generally useful. A large increase has taken place in the requests for information made by immigrants from Europe and the United States, regarding the climate of the country where they wish to settle. The information has been furnished by voluntary observers who have been giving similar information for twenty years past.

Requests are also increasing for meteorological data for use in the settlement of legal cases, regarding damage byweather.

The number of voluntary observers is largely over two hundred, most of whom have reported during the year. Other observers are paid according to the importance of the station. The staff in receipt of pay during the year numbered 248, of which twenty-four were on the permanent staff of the Central Office, nine employed temporarily at the same office and seven are retained permanently at chief stations where they devote the whole of their time to the work. The total number of stations from which reports are received is 454.

The new meteorological building at Toronto was completed during the year and is spoken highly of for its utility and fine appearance. The architect who designed the building and the officer who had charge of construction, both of the Public Works Department, have received great praise.



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The extensions of forecasts and storm warnings which were proposed in 1908 for Newfoundland, took place during the year 1909, and meteorological bulletins have been sent similar to those received in the maritime provinces. Newfoundland is not as well situated geographically for forecasting as the maritime provinces, as a certain percentage of high and low areas approach the island from the territory between Labrador and Hudson bay, while others move northward from the Atlantic, and, it is only from barometric changes occurring at Bermuda and Sable Island, that their approach may be suspected. The Newfoundland government has established valuable stations at Point au Basques on the extreme west, and at Burin in the south, both of which stations forward bi-daily reports to Toronto.

The chain of barometric stations established in the summer of 1908, in the Mackenzie River valley, are furnishing most valuable observations of atmospheric pressure in the far north.

The director asserts, in his report, that it is doubtful whether there is any other region of the globe where the distribution of atmospheric pressure has so pronounced an effect on weather conditions as in southern Alberta. This appears, from the report to be due to north winds from high latitudes meeting mild ocean air from the west still further raised in temperature by chinook effect.

The observatory on Sulphur Mountain, located at a height of 7,484 feet, was built ten years ago, and is now beginning to produce facts concerning the movements of the upper strata of the atmosphere, which will be of value in the study of the climate of our western plains.

Inspection of stations took place throughout Canada and at the stations in Newfoundland and Bermuda.

The importance of visiting Bermuda is seen by the fact that the weather forecasts for Newfoundland, are made partly from Bermuda observations. Some important and necessary improvements were made at this station.

The first inspection of the Peace river stations were made during the year.

Between April 1, 1909, and March 31, 1910, 1,895 warnings were issued to ports on the great lakes, Gulf of St. Lawrence and maritime provinces, 92 per cent of which were verified and thirty-one warnings to Pacific coast ports, 77 per cent of which were verified.

Fruit growers were supplied with forecasts for frost in the Niagara districts, and warnings were furnished railways, of snow falls and drifts.

Volcanic disturbances were recorded on the seismograph at Victoria, B.C., and Toronto; the vibrations on the Victoria seismograph exceeded the scale of the instrument, in striking contrast to the small movement recorded at Toronto.

The time service has been continued, but from the new building, where several of the clocks have been placed. During the year ninety-one observations for time were made, two being solar and eighty-nine were sets of stars taken in the meridian of the observatory. The transit in its new position operated much more satisfactorily than in the old observatory and the sidereal clock was much steadier, due to the uniform temperature of the new clock room.

The equatorial telescope has been overhauled and mounted on a pedestal, the difference in level between the old and new observatories has been ascertained. The



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time exchanges with Quebec, Montreal and St. John N.B., have been continued and the results shown in a table.

Appendix A to the report of the Director of the Meteorological Service, contains the account of the operations at St. John, N.B. It will be seen that forecasts of the weather are telephoned to all the offices of the New Brunswick Telephone Company at six o'clock in the morning, and displayed on forms in the office. This valuable work is done gratuitously by the company.

Automatic clock signals are transmitted direct from the Standard mean time clock over the Western Union lines throughout the maritime provinces. These signals are automatically repeated from the land lines to wireless telegraphy at Camperdown, N.S., and distributed to ships at sea within the zone of the Marconi station.

Appendix B of the directors report is the report of the observer at Quebec, who states that the observations were taken as usual.

The report of the Director of the Meteorological Service contains also a report on the work at the magnetic observatory at Agincourt, Toronto. The report states that it is very evident that the observatory holds an important place as a base station for the science of terrestrial magnetism in Canada, and also, as a centre at which the standard instruments of other countries may be compared with those of the Dominion.

Mr. Jackson of the meteorological staff was appointed meteorologist for the *Arctic* expedition of 1908-9, and obtained magnetic values at a number of places during the cruise. The determinations will be a valuable contribution to the science of terrestrial magnetism. The table will be found in the report of the *Arctic* expedition.

## METEOROLOGICAL BUILDING.

During the year, the new Meteorological building which had been under construction for some time, was completed. It is situated on the corner of Bloor street and Devonshire Place, Toronto. The lot upon which the building has been erected is 274 feet 4 inches in length along Devonshire Place, by 150 feet 2 inches in width on Bloor street.

The building is 88 feet in length by 57 feet in width. The front or north elevation is on Bloor street and the east elevation and tower on Devonshire Place. The building throughout is substantially built of hard pressed brick and the exterior walls lined inside with porous brick, all laid with Portland cement and lime mortar.

The foundation walls are of stone, built with Portland cement and lime mortar and plastered inside with the same kind of mortar, placed on the stone work. The basement floors are made of concrete, smoothly laid and finished.

The beams, girders, lintels, posts, rafters and purlins are of steel, covered with cement and lime mortar.

Tile floors are laid in the first and second floor, hall, corridors and stair landings, and hearths and fireplaces are built of the same material. The stairs are built with steel stringers, cast iron newel posts and wrought iron balustrades and the treads are of slate.

The outside is given a handsome appearance by the cut stone-work which forms the plinths, copings of area, steps, door and window sills, jambs, mullions, transoms, heads and arches of windows and doors, eave cornices, corbels and belt courses, gables and chimneys.



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The basement contains the seismograph and barograph room where photographs are also developed, test room for recording instruments, a printing room where the weather chart plates are moulded and forecast bulletins printed, spare room for messenger and caretaker, store-room, lavatory, boiler-room and coal bunkers. A corridor runs the length of the building in the centre of the basement from east to west from which the several rooms are entered; and an entrance is made from the east end of this corridor to the lower part of the tower. The stairway with landing leading to the first floor completes the arrangement of the basement.

The first or ground floor of the building contains a vestibule inside the main entrance, the main hall in the middle of the building, a stairway and landing at the south end of the hall, the rear entrance to the building and a corridor in the centre of the building running from east to west at right angles to the main hall from which corridor the offices are entered. The Director's room is on this floor, the forecast and map-room, record-room, two offices for the principal assistants of the Director, secretary and stenographers' room, clerks' room, transit and clock room, lavatories and other toilet rooms. In the tower on this floor the magnetic records are kept. The transit instrument and clocks rest on pedestals built on footings resting on the ground.

The second floor contains a hall and a corridor arranged similarly to the ground floor corridor, large library, three officers' rooms, telegraph office, photograph room, instrument and store-room, stairway and landing and a vault in the tower for valuable records.

The attic contains apartments for keeping reports, charts, books and papers and a stairway leads from it to the dome room in the tower. The dome room contains numerous windows separated by pillars on the outside; underneath the stone sills of the windows a balcony surrounds the tower supported by brackets and a cornice. The upper part of the tower containing the dome is less in diameter than the main body of the tower and is finished outside with window heads and cornices of stone. The dome rests and revolves upon a track within the tower. Openings are made in it for observations with the telescope which, with its carriage is mounted on a pedestal of concrete in the centre of the tower, having its foundation on a footing level with the foundation of the tower itself.

The inside of the main building is handsomely finished in hardwood with the natural colours retained and the iron work painted.

The heating, lighting and plumbing are of the latest practice and the whole edifice is a handsome and spacious construction, affording every facility for carrying on the Meteorological service of Canada at the central office.

The outbuildings are two, and consist of a transit house with chronometer room, and a workshop, both built of clinker bricks, wooden beams, joists and rafters.

The workshop is equipped with a dynamo, shafting and pulleys and necessary tools for mechanical work required in connection with the central and other stations.

The grounds are not yet completed but when finished will be terraced and have granolithic walks where necessary.

The building was constructed by the Public Works Department for the use of this department.

The report of Mr. Stupart forms Appendix No. 8 of this report.



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## CORRESPONDENCE AND RECORD BRANCH.

The Records branch of the department embraces the receiving and despatching of letters. The letters and telegrams received are registered, numbered, stamped with date received, indexed, placed on files and the files charged and distributed to the officers who take action upon the letters and telegrams. Copies of letters are placed upon the files, and the files examined to ascertain if all letters have been answered or acknowledged and then they are discharged and placed in receptacles.

The registering of letters consists of entering the number of the file and a brief synopsis of the subject of the letter; the indexing includes pages of personal names in a book, and the card system, locality names, subjects and vessel names. The number of communications received during the year was 47,000.

The letters and telegrams despatched are copied in letter press books and indexed. The number of letters despatched during the year was 30,000. The increase in the numbers of letters received and despatched during the last ten years, shows the growth of the work of the department and consequent increase of staff, as a whole, including the records branch. An establishment book is maintained in this branch in which the names of all employees of the department are recorded.

The letters received in 1901 numbered 18,741 and despatched 13,000, while in the past year 47,000 were received and 30,000 despatched.

## WRECKS AND CASUALTIES.

Captain Demers, Wreck Commissioner, reports thirty-two investigations into casualties in Canadian waters up to January, 1910. Decisions were rendered on all except one.

The number of Canadian vessels wrecked in foreign waters, and foreign vessels wrecked in Canadian waters during 1908-9 was, sea-going, 71 totally and 221 partly wrecked; the loss was \$77,383, and thirteen lives were lost. In the inland waters, thirteen vessels were totally wrecked and thirty-eight partly wrecked; the loss was \$369,383 and eleven lives were lost. The total loss of lives was twenty-four.

The total tonnage wrecked was:—

Sea-going.. . . . .	772,583
Inland.. . . . .	31,783
	<hr/>
Total loss of tonnage.. . . . .	804,366
The total loss was.. . . . .	\$1,139,766

## PILOTAGE.

Reports for the calendar year 1909 have been received from twenty-one pilotage authorities. They are published in full in Supplement No. 1 to the annual report for 1909, and contain information respecting the number of pilots, the number of vessels piloted and the financial transactions in each district. The number of 'branch pilots' in active service, according to these reports, was 382, and the gross earnings were \$415,039.31.



The Montreal and Quebec pilotage districts are under the direct control of this department and under the supervision of Captain Demers, chief examiner of masters and mates, who submitted the pilots of both districts to the Holmgren sight test, which is used by the British Board of Trade.

MARINE SCHOOLS.

The report on marine schools, by Captain Demers, which forms Appendix No. 9, gives information respecting the number of lectures delivered, the attendance at each school and the total number of seafaring men who availed themselves of the teaching imparted at those schools, respecting their occupation. Regret is expressed that the importance of the lectures is more generally appreciated.

Seven schools were open during the winter season and 206 lectures delivered to a total attendance of 2,676 seamen; 626 of this total attended the school at Victoria, and 850 the one at Vancouver, B.C.

MASTERS AND MATES.

Certificates of competency issued to masters and mates of inland waters for the year ending December 31, 1909.

Masters.. . . . .	150
Mates.. . . . .	130
Sea-going—	
Masters.. . . . .	13
Mates.. . . . .	25
Second mates.. . . . .	25
Certificates of Service—	
Masters.. . . . .	3
Mates.. . . . .	1

Total receipts derived from certificates, \$3,324.

SHIPPING AND DISCHARGING OF SEAMEN.

As may be seen by reference to Appendix 44 of the supplement to the annual report for 1909, the shipping masters at many ports fail to send returns, as required by the Shipping Act.

The number of seamen shipped, discharged, and the amount of shipping master's fees are:—

	Seamen Shipped.	Seamen Discharged.	Fees Collected.
Quebec.. . . . .	6,948	1,428	\$ 2,768 09
New Brunswick.. . . . .	2,503	892	1,518 10
Nova Scotia.. . . . .	7,373	5,799	5,572 30
British Columbia.. . . . .	3,460	3,249	2,477 40
Prince Edward Island.. . . . .	218	205	161 50
	<hr/> 20,502	<hr/> 11,573	<hr/> \$12,497 39



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## HYDROGRAPHIC SURVEY.

The hydrographic survey work is in charge of Mr. J. Stewart, who has reported upon the work in the different waters in which the hydrographic survey staff has been employed.

The same surveying parties as were engaged last year were placed at work, but in slightly different localities.

The party on the great lakes under Captain Anderson, was moved from Lake Superior to Lake Ontario, working off the south shore of Prince Edward County. Fair progress was made but sufficient work was not done to make it possible to publish a chart of the season's operations here, but the work will be continued.

The party on the Atlantic coast under command of Captain Miles worked in the St. Lawrence river opposite Bic, and considering the very bad weather, made very fair progress on the steamer *La Canadienne*.

The work of the party is now in the printer's hands and the chart will be issued next season.

In July last, a contract was entered into by the department with Swan Hunter & Wigham Richardson, for the construction of a new and more powerful steamer to replace *La Canadienne*, which has been found unable to cope with the strong currents encountered in passing to and fro on the river.

The party on the Pacific coast has been divided in two, one working from the steamer in Dixon entrance in the approach to Prince Rupert harbour. Quite an area in the middle of Dixon entrance, left undone by the admiralty surveying ship, was sounded over, and some work done in Masset inlet.

The other party worked in more sheltered waters in the channels approaching the same harbour from the south. Here too, very bad weather was experienced. About two-thirds of the days were rainy and a considerable number of the other had a good deal of wind, so that work in this locality was necessarily very slow.

They surveyed part of the approaches to Skeena river and completed the triangulation of the channel southeast of Lawyer island preparatory to taking up the sounding in the season of 1910.

The fourth party under Mr. Chas. McGreevy, completed its work in Cumberland basin, N.S., and moved to Tatamagouche bay, there to ascertain what facilities there were for building wharfs.

The fifth party under Mr. Pinet was engaged in the continuation of the survey of Lake of Two Mountains, Ottawa river. This work was almost completed and will require only a few weeks of the season of 1910.

During the fiscal year, fourteen charts of various parts of the waters of the Dominion were placed on sale to the public, and the demand therefore has been very reasonable.

## SICK AND DISTRESSED MARINERS.

Under the provision of the Canadian Shipping Act, chapter 113, Part V, s. 384 R.S., dues of 1½ cents per ton, registered tonnage, are levied on every vessel entering any port of the provinces of Quebec, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia. The money thus collected forms the 'Sick Mariners



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Fund.' Vessels of the burden of one hundred tons and less pay the duty once in each calendar year, and vessels of more than one hundred tons registered tonnage, three times in each year.

The officers and seamen of all fishing vessels not registered in Canada, do not pay 'Sick Mariners' Dues,' nor participate in the benefits accruing therefrom, but such vessels registered in Canada may pay dues and participate in the benefits, but if of more than one hundred tons, only for the voyage at the beginning of which payment has been made, but vessels shall enjoy the same rights and benefits as are enjoyed by vessels which pay dues but are not engaged in fishing.

The receipts for the fiscal year ended March 31 last, amounted to \$53,732.31; the expenditure for the several provinces for sick seamen amounted to \$63,709.16, and for distressed seamen, \$2,640.10, total, \$66,349.26.

The receipts of sick mariners' dues from each province are as follows:—

Quebec.. . . .	\$13,402 80
New Brunswick.. . . .	9,412 88
Nova Scotia.. . . .	16,844 87
British Columbia.. . . .	13,744 10
Prince Edward Island.. . . .	327 66
<hr/>	
Total expenditure.. . . .	\$53,732 31

The expenditure for each of the provinces is as follows:—

General account.. . . .	\$ 1,484 33
Nova Scotia.. . . .	28,763 48
Prince Edward Island.. . . .	2,874 33
New Brunswick.. . . .	8,210 46
Quebec.. . . .	11,495 24
British Columbia.. . . .	10,881 32
<hr/>	
Total expenditure.. . . .	\$63,709 16

The 'Sick Mariners' Act ' does not apply to the province of Ontario, so no dues are collected from vessels in that province.

At the port of Quebec, sick mariners are cared for at the Jeffery Hale and the Hotel-Dieu hospitals, at a per diem allowance of \$1.50 per seaman, including medical attendance and board.

At the port of Montreal, sick seamen are cared for at the General hospital and at the Notre Dame hospital. The charge per diem for each seaman, including board and medical attendance is \$1.50.

At the port of Chicoutimi, sick seamen are cared for at the Hospital St. Valier; the charge per diem, for each seaman, including board and medical attendance is \$1.20.

Marine hospitals are maintained in Louisburg, Yarmouth, Pictou, Sydney, Lunenburg and Point Tupper, in the province of Nova Scotia; and the sick seamen at Halifax, N.S., are cared for in the Victoria General hospital at \$1.50 per diem per man, including board and medical attendance.



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At Charlottetown, Prince Edward Island, sick seamen are cared for at the Charlottetown and Prince Edward Island hospitals under arrangements made by the department with the managers of those institutions at \$1.50 per day.

The Marine hospital at Victoria, British Columbia, has a medical superintendent who receives \$600 per annum, and a keeper whose salary is \$600 per annum. He is also allowed \$5 per week for the board and attendance of each sick mariner.

At Vancouver, sick seamen are attended at the Royal Columbian hospital at a cost of \$1 per day each.

At St. John, N.B., sick seamen are attended at the General Public Commissioners' hospital at a cost of \$1.50 per day each.

Where no hospital is maintained at the maritime provinces, Quebec and British Columbia, the collectors of Customs are authorized to care for sick seamen when the vessels to which they belong have paid 'Sick Mariners' Dues.'

Statement of receipts and expenditure on account of 'Sick Mariners' and 'Distressed Seamen' from the fiscal year 1900 to 1909, both inclusive.

Year.	Receipts.	Expenditure.
1900.. . . . .	\$59,971 84	\$32,743 30
1901.. . . . .	59,783 34	34,944 93
1902.. . . . .	65,853 83	51,827 12
1903.. . . . .	64,851 55	48,151 48
1904.. . . . .	61,778 29	50,801 78
1905.. . . . .	58,372 34	51,000 18
1906.. . . . .	60,183 90	50,120 42
1907.. . . . .	44,704 59	37,362 11
1908.. . . . .	69,364 45	59,957 92
1909.. . . . .	53,732 31	66,349 26

The total amount of salaries paid to medical officers for the fiscal year was \$12,995.82, and the total number of seamen treated was 3,629.

The report of C. H. Godin, M.D., medical superintendent of Marine hospital service, forms Appendix No. 18.

## WRECKING PLANT.

The yearly subsidies were paid to contractors when they became due and proof shown of the maintenance of the plant in readiness to render assistance, in cases of casualties to vessels. The amount of the subsidy to each contractor is \$10,000 per annum, paid semi-annually.

The contracts were made for a period of five years with each contractor. For the lower St. Lawrence the contract was made with Messrs. Geo. T. Davie & Sons, Lévis, P.Q., headquarters of the salvage plant, at Quebec; for the maritime provinces with the Dominion Coal Company, headquarters of the salvage plant, North Sydney, C.B.; for British Columbia, the British Columbia Salvage Company, headquarters for the salvage plant Victoria.

The following is a list of vessels assisted or salved by the plant of The Dominion Coal Company, Limited, during 1909.



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May 25.—Schooner *J. & L. Irving* loaded with a full cargo of coal went ashore at Big Bras d'Or. Tug *C. M. Winch* went to her assistance immediately, and, after transferring part of her cargo into another schooner, succeeded in pulling her off, after which she was towed to North Sydney.

June 15.—The American fishing schooner *Arthur Binney* went ashore on Forchu rocks. Tug *Douglas H. Thomas* went to her aid immediately, but on account of the high sea running at the time, no assistance could be rendered. The tug made several trips to the scene after June 15, but it was not until June 28, that the sea permitted her to get close enough to the schooner to attach a hawser. On the latter date both the tug and the ss. *Cape Breton* pulled on this schooner, but they were unable to move her. The steamer parted her 12-inch hawser in her efforts to save this vessel.

June 15.—At the request of the owners of schooner *Baltic*, which vessel was ashore near Grand Narrows, a diver and his assistant were sent with complete diving outfit to that place. They were absent two days, during which time they rendered satisfactory services to the owners of this vessel.

June 29.—SS. *Bonavista* while on her way to Montreal, picked up steam yacht *Scionda* in a helpless condition, off St. Dennis in the River St. Lawrence. The steamer took crew off yacht, but owing to the latter making water so rapidly, she was obliged to beach her on Crane island.

July 27.—SS. *Cairnrag* was reported to be ashore at Dover island, near Canso, and tug *Douglas H. Thomas* proceeded immediately to her assistance. Tug returned on July 28, and reported that wreck had broken up in the heavy swell shortly after running aground.

August 13.—SS. *Jeanara* ran aground at Cranberry Head. The steamers *Cape Breton* and *Coban* and tug *C. W. Winch* were sent to her aid immediately, and she was floated by them at high water on the following day. The prompt action of our wrecking fleet saved this steamer from being a total loss as she was in a most dangerous position being aground in one of the worst locations on the coast.

August 19.—At midnight on the 19th the company was requested to try to locate the son of the lighthouse keeper at Scatteri, who was reported to be long overdue in a gasoline launch from Mainadieu. The steamer *Louisburg* and tug *C. M. Winch* were immediately sent in search and cruised around continually until midnight on August 20. In the meantime, this man had been picked up near Scatteri.

August 21.—Steamer *Sandsend* arrived in Sydney harbour with her bulwarks started and cargo shifted. The tug *C. M. Winch* was sent to render her assistance, but her services were declined by captain.

September 2.—Received information that an unknown steamer was ashore at Lingan Head. Tug *Douglas H. Thomas* proceeded to the scene at once, and while nearing there, she met steamers *Tyrian* and *Gladiator* who reported that schooner *Myrtle* ran aground at Lingan Head during the night of September 1, and the above two steamers tried to float her, but she went to pieces in the heavy sea.

November 17.—Received information from captain of schooner *Argosy* that his vessel was ashore at Grand River, C.B. The tug *Douglas H. Thomas* was despatched immediately but, owing to the unfavourable weather conditions, she could not get into Grand River.



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November 16.—Schooner *Myrtle V. Hopkins* went ashore on Livingston shoals, near Lowpoint, during a heavy gale. Tug *C. M. Winch* went to her assistance, but, owing to a very heavy sea running, nothing could be done.

December 20.—Received information that the ss. *Corinthian* was ashore at Georges island, in Halifax harbour. The services of *Douglas H. Thomas* and *Louisburg* and also *Bonavista* were offered for salving purposes, but her agents declined.

January 5, 1910.—Information was sent by telephone from the agent, Marine and Fisheries Department, Halifax, that seventy-eight men in fishing boats were driven to sea from Whitehead in a blizzard during the night of January 4. The ss. *Cabot* which was then discharging her cargo at Goldboro, sailed immediately in search of the fishermen. The ss. *Coban* was also despatched from Sydney. The *Cabot* arrived at Whitehead at midnight January 5, with twelve of the missing men and one boat. She sailed again and continued searching until January 8, midnight, when she arrived at Goldboro. The *Coban* returned to Louisburg January 7 and reported having cruised twenty-five miles S.E. and W. of Whitehead buoy, but saw nothing of the missing boats. The ss. *Cape Breton* which sailed from Sydney for Halifax and arrived at the latter port January 8, reported having cruised from twenty-five to forty miles off shore between St. Esprit and Beaver, over thirty-six hours, but saw nothing of the missing boats.

January 8.—Received word from New York that steamer *Hirundo* was reported by wireless as having broken her shaft in latitude 40° 23 min. longitude 56° 41 min west of Paris. The *Douglas H. Thomas* and *Caccuna* were both despatched in search of the disabled steamer. Both vessels returned January 10, having seen nothing of *Hirundo*. The *Cacouna* resumed search again on January 11. On January 14 the company was notified that the disabled steamer had arrived at St. Johns, Newfoundland.

January 25.—Ferry steamer *Hygia* lost her propeller on way from Sydney to North Sydney, and was obliged to anchor. Tug *C. M. Winch* went to her assistance and towed her to North Sydney.

The services rendered by the plant of Messrs. George T. Davie & Sons:—

The only vessel salvaged was the ss. *King Edward* ashore on Anticosti from the fall of 1908, and assistance rendered to the ss. *Campana* which proved to be a total wreck.

The services rendered by the British Columbia Salvage Company, Limited, during 1909:—

May 15.—SS. *Tees* towed vessel off rocks near Brackman Kerr's wharf, Victoria harbour.

August 28.—SS. *Ohio* made a survey of vessel ashore in Carters bay. Recovered and brought back bodies.

May 22.—SS. *Daisy*, ashore at Mayne island, floated the vessel and brought her to Sydney.

October 2.—SS. *Mystery* ashore at Mayne island, floated and brought to Vancouver.

## MONTREAL HARBOUR COMMISSION.

The harbour opened on April 16, and closed on September 27. The date of opening was much earlier than other years since 1900 except 1902 and 1903, when the dates



of opening were April 3 and April 2 respectively, and the date of closing twelve days later than that of 1907, which was the latest date since 1900. The first vessel arrived in the harbour from the sea, on April 23, and the last departed for the sea on November 28.

The total number of sea-going vessels which arrived in the harbour was 670, having a total tonnage of 1,911,413 tons register. Of these, 478 were British with a tonnage of 1,480,503 tons register; 172 Norwegian with a tonnage of 381,396 tons register; eight German, tonnage 26,678; four Dutch, 11,935 tons; three Danish, 6,877 tons; four American, tonnage 1,886 tons; one Italian, 2,338 tons.

Of these vessels 644 were built of iron or steel with a tonnage of 3,514 tons.

Vessels numbering 299, with a total tonnage of 474,450 tons, entered the harbour from the lower St. Lawrence. Of these, 273 were steamers and 26 sailing vessels. This shows a decrease of 76 vessels and 168,466 tons, on the previous years entrance.

Transatlantic vessels to the number of 371 entered the harbour with 1,436,969 tonnage. All the vessels were steamers. This was an increase of seven vessels and 121,275 tonnage over that of 1908, and the greatest tonnage of this class in ten years.

10,991 inland waters vessels with a total tonnage of 3,146,494 tons entered the harbour during the year—a decrease of 1,443 vessels and 442,930 tons from the previous year's entrance.

The total number of vessels of all kinds which entered Montreal harbour during the year was 11,661, with a total tonnage of 5,057,907 tons—a decrease of 1,512 vessels and 490,121 tons.

The total receipts for the year were \$687,772.16. The harbour revenue of \$413,648.83, shows an increase of \$26,781.55 over that of the previous year.

The revenue from the fourteen sheds rental was \$101,500, and shows an increase of \$72,500 over that of the previous year which was from seven sheds; and the expenditure on account of sheds, \$114,803.33.

The traffic department revenue was \$104,266.43—an increase of \$35,922.98 over that of the previous year.

The grain elevator revenue was \$65,987.90—an increase of \$20,636.34 over that of the previous year; and the expenditure on the same account was \$81,312.14.

The revenue from the floating crane for part of the year was \$2,369 against an expenditure of \$5,997.69.

The total disbursements chargeable to revenue were \$686,710.73—an increase over that of the previous year of \$32,617.60, of which \$25,407.62 was for interest on loans.

The total amount disbursed on capital account was \$875,510.92.

New steel sheds.. . . .	\$276,496 25
Harbour improvements.. . . .	244,640 37
Elevator conveyors and equipment.. . . .	185,302 00
Grain elevator No. 1.. . . .	127,000 00
New floating crane, bal.. . . .	39,844 27
Locomotive, bal.. . . .	26,228 03
	<hr/>
	\$875,510 92

The sum of \$1,065,000 was borrowed from the government.



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The debenture debt of the corporation, on December 31, 1909, was \$13,092,000 of which \$1,972,000 is to the public and \$11,120,000 to the federal government.

## TRANSPORTERS.

The design of the trial transporters consists of a carriage mounted on rails imbedded in the concrete floor and having a tower fixed on a turntable, for carrying the cantilever arms. These cantilever arms are long enough to extend out of the shed on the harbour side and take cargo directly through the hatches of the ship and hoist and transport it to the middle of the shed. The machine can be travelled across the shed and the reverse system can be adopted and freight removed from the middle of the ship and lowered to carts or railway cars.

The carriage has a slewing mechanism or turntable, so that the transporter arm can be slewed thirty degrees to one side or the other so as to meet ships' different hatches.

The cantilever arm extends 46 feet and on the shore side 34 feet, and with a wheel base 14 feet. The total transporting distance is 94 feet.

The machines are fitted with three separate motors.

Lifting.. . . .	60 B.H.P.
Traversing.. . . .	10 "
Travelling.. . . .	5 "

At the actual trial, with 2-ton loads, the lifting speed was 328 feet per minute, the traversing 317 feet per minute and the traction or travelling across the shed, 51 feet—all of which exceeded the specified requirements.

Although the operators were not fully accustomed to the shed gangs organized for this work, the actual freight handled, covering a period of twenty hours—a day and a night—amounted to 400 tons or twenty tons per hour. This was as fast as the packages could be made up and trucked away and stored in the shed.

The machines, from every point of view, gave satisfaction not only as to suitability of design, but as to speed and careful handling of the goods. The two machines worked, without a hitch, when required during the summer.

## ELEVATOR.

There were 11,691,071 bushels of grain handled by the Harbours Commissioners' elevator during the year 1909:—

The following table shows the elevator capacity in Montreal:—

	Bushels.
Harbour Commissioners' elevator No. 1.. . . .capacity	1,000,000
Montreal Warehousing Company, elevator 'A'.. . . ."	500,000
" " " " 'B'.. . . ."	1,000,000
" " Ogilvie " 'C'.. . . ."	600,000
Canadian Pacific Railway Co., " 'A'.. . . ."	500,000
" " " " 'B'.. . . ."	500,000
	<hr/>
	4,100,000



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The Commissioners' Elevator No. 1, is equipped with a new conveyor system capable of shipping from 300,000 to 500,000 per day of ten hours and with two marine legs capable of intaking from 200,000 to 280,000 bushels in twenty-four hours.

The grain conveyor system, which last year extended from elevator No. 1 to ten of the fourteen steel sheds, enabling ten vessels to be loaded without leaving berth, was extended to the four sheds on Jacques Cartier pier.

This necessitated the construction of four additional towers, a shore connecting gallery and two long galleries, over sheds Nos. 12-14 and 13-15 of a total length of 1,936 feet and requiring 7,372 feet of conveyor belting, nine motors, an extension of the electric light, telephone and signal system.

The operation of the elevator and conveyors require forty-four motors of 2,710 B.H.P. Five hundred lights are installed in the conveyor galleries alone.

Grain can now be delivered by a spout to a vessel 2,142 feet from the elevator, at a rate of 15,000 bushels per hour; fourteen vessels can be loaded without leaving berth, of which four can be loaded at the same time.

#### FLOATING CRANE.

The Floating Crane, constructed for the commissioners by Messrs. Vickers Sons & Maxim, arrived at Sorel on May 23, where it was erected, and it reached Montreal on July 12, ready for operation. The first test was made on July 28, when a car loaded with steel rails and weighing 150,000 pounds or seventy-five tons was lifted at a radius of 54 feet. The car was swung around 360° and returned to the track. It has since been used with much satisfaction on various kinds of work. A proof of its value for wrecking purposes was furnished in October last when the steamer *Prescott* was burned and sank at Victoria pier. The commissioners contracted with the owners, the Richelieu & Ontario Navigation Company to raise the wreck and with the aid of the Crane, completely removed it in thirteen days.

The extension and improvement of wharf accommodation has been continued; 64,000 cubic yards were added to the embankment between Victoria bridge and Bickerdike pier making about 36,000 square feet of new ground.

One hundred and forty-two feet of cribwork and concrete wharf was completed. The total length of concrete wharf now on sections 23 and 24 is 777 feet.

Two hundred and eighty-four feet of cribwork wharf was completed to full height and one hundred feet additional cribwork foundation and concrete superstructure finished on section 37, Dominion Coal Company's wharf. The length of sections 36 and 37 is now 959 feet.

A new wharf, for the Vulcan Portland Cement Company was begun and finished. It is 450 feet long, of cribwork and concrete, and great care has been exercised in preparing a solid foundation.

The wharf accommodation under the control of the harbour commissioners now consists of 17,825 lineal feet or 3.375 miles for vessels of 30 feet draft. 18,220 lineal feet or 3.450 miles for vessels of 25 feet draft; 3,137 lineal feet for vessels of 20 feet draft or under, making a total wharf accommodation of 39,180 lineal feet or 7.419 miles of wharfs.



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Cost of the harbour improvements, \$13,000,000. Fourteen steel sheds, 1,254,093 square feet or 28.79 acres, total cost of sheds, \$3,370,130.05 including cost of structure for grain elevator.

There were 3,638 feet of new rails laid during the year. The total length of railroad under the control of the harbour commissioners is 149,213 feet or 28.26 miles.

The total area of paving laid in 1909, was 4,642½ square feet.

The railway tracks were kept in excellent repair. Manganese tongue switches of new design were installed in several places and extensive repairs made to the two raceways at Windmill point.

## HARBOUR BOUNDARIES.

By Act 8-9 Edward VII. chap. 24, the boundaries of the harbour were extended so as to include the whole of the water front on both sides of the river up to high water mark, as far as the foot of Montreal island.

The total length of the harbour now is 16.91 miles.

A 12-inch main was laid from the city water main to Bickerdike pier, designed for fire protection and water supply on that pier.

## FIRE PROTECTION.

The gong of the fire-alarm system and boxes were overhauled in the spring and put in good order and are constantly inspected day and night. The buildings in the harbour yards are patrolled day and night. A hose cart with necessary equipment is stationed in store room and the men so drilled that streams of water can be directed on a fire in the yards in half a minute.

The foundation for the coal tower of the Montreal Light, Heat and Power Company was completed on May 10.

The steel sheds, not equipped with chutes for handling freight from the upper stories were supplied during the year.

The cleaning of the wharfs and roadways was conducted on the most improved plan under the supervision of an experienced foreman.

## FIRES.

Fire broke out on five different occasions within the harbour front during the year. The fire tug *St. Peter* and the other fire apparatus of the commissioners were brought into requisition with speed and effect and the fires extinguished before much damage was done. The destruction of the ss. *Prescott* by fire on the night of August 27, was the only serious fire during the year.

The traffic department continued to give entire satisfaction. More cars have been handled during the year than in any previous one by 6,238 cars.

## QUEBEC HARBOUR COMMISSION.

## HARBOUR IMPROVEMENTS.

The inner and outer basins, dock walls, Louise docks, were deepened and strengthened. Paved roadway with stone sidewalk was laid. The foundations for two Cantilever coal discharging towers were completed. Portions of the inner quay surface were



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planked. A landing shed was erected on the breakwater extension. New lines of railways and diamond crossings were laid, planking in front of new coal shed completed and a carter's stand was laid.

The baggage platform, formerly in front of the Immigration building, has been removed to a more suitable locality, the covered way has been elevated, which greatly improved the surface facilities of the Louise docks.

Fire alarm boxes have also been placed in suitable places on the Louise embankment.

There were 37,333 tons Anthracite coal landed; the coal landed amounted, in all, to 252,411 tons.

The outward shipping consisted of eighty-nine vessels of 95,066 tons register, and the exports to 15,219 tons general cargo; 5,531 tons pulp and paper; 496 tons asbestos; 28,741 P.S. lumber and timber.

In 1908, the outward bound vessels numbered seventy-two, of a total tonnage of 197,872 register tons and a total export of 28,593 tons and 18,895 tons P.S. lumber and timber. This shows an increase of seventeen vessels, a decrease of 102,806 tons register and 7,626 tons general exports; and an increase of 9,846 tons P.S. lumber and timber exported.

#### LOWER PORTS.

In 1909, lower ports imported 930 tons general cargo and shipped 1,110 tons.

In 1909, they imported 976 tons and exported 2,088 tons—an increase in imports of forty-six tons and 978 tons increase in exports.

As in 1908, so in 1909, the Quebec harbour was open all winter. In 1908, the ice bridge did not form—in 1909, it formed on January 6.

The ice in the tidal basin broke on April 6, 1909, or fifteen days earlier than last year.

The first passenger boat left the harbour for the lower St. Lawrence on April 11, or four days later than on 1908.

The first ocean steamer with coal entered the harbour on April 21, the same date as in 1908.

The ice in the St. Charles and north channel between the island of Orleans and the main land broke up on April 19, or five days earlier than last year.

On October 16, 1909, almost all the buildings on Point-a-Carcy wharf were destroyed by fire, including the marine tower, conveyor galleries and the Canadian Northern Railway Company's elevator, police station, landing sheds, Nos. 19 and 21, cold storage and other buildings.

The revenue of the commissioners during the year was:—\$106,848.20; the expenditure, \$106,353.47, leaving a balance on hand, on current account, of \$494.73.

The expenditure on capital account during the year amounted to \$110,392.40.

The customs returns show that for the year 1909, 369 vessels of 1,378,349 tons register, employing 38,224 men, entered Quebec harbour. In 1908, by the same returns 356 vessels of 1,265,827 tons register employing 33,714 men entered, showing an increase of thirteen vessels, 112,522 tons and 4,530 men. Of these, 332 were British vessels of 1,311,980 tons and employing 36,952 men.



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Outward bound vessels were:—

For 1908:—194 vessels of 607,780 tons register, employing 19,786 men.

For 1909:—175 “ 536,990 “ “ 17,153 “

Or a decrease of 19 vessels 70,790 tons register and 2,633 men employed.

The timber, deal and lumber business on the St. Lawrence river during the year is as follows:—

	Montreal.	Quebec.	Three Rivers.	Other Ports.	Total.
1909.. ..	115,045,905	56,608,959	15,093,630	60,351,738	247,100,232
1908.. ..	108,606,459	59,619,761	8,348,917	37,904,614	214,473,751

Total increase, 1909—32,626,481 feet board measure.

## TORONTO HARBOUR COMMISSION.

The number of vessels which arrived in Toronto during the year 1908, was 3,430.

The number which entered in 1909, 2,939 or a decrease of 492 vessels during the year.

The tonnage of 1908 was 1,521,165 tons.

The tonnage of 1909 was 1,480,293 tons, a decrease of 40,872 tons.

The harbour was clear of ice on March 27, which was eighteen days later than in 1908.

The first vessel arrived on March 31, and the last left the harbour on December 18. The harbour buoys were placed on March 31, and raised on December 15.

The amount of coal imported by vessels during the year was 123,374 tons, which is 25,304 tons less than for 1908. This shortage is due to the importation of electricity from Niagara Falls by the electric light company.

The total amount of coal imported by rail and vessel, was 1,131,728 tons or 90,864 tons less than last year.

One hundred and seven vessels of all kinds wintered in the harbour, viz.: eight passenger steamers, nine propellers, nine tugs, four sailing craft, three tow barges, ten ferry steamers, thirty pleasure sailing yachts, five dredges, four steam cranes and eighteen dump and flat scows, representing about 20,042 tons register.

There were 16,847 cubic yards dredged in the harbour during the year.

Extensive repairs were made at the eastern entrance, 16,000 feet of the west pier has been renewed in concrete, 2,500 feet long of cribwork has been completed for the southern pier and 700 feet with part of the concrete superstructure of the north pier. About fifty acres of land has been made by the dredging in the harbour.

A new building 36 by 20 feet was erected for the life-saving station by the Department of Marine and Fisheries.

Extension of 1,500 feet to the breakwater on the southern shore of the island was completed.

Storm signals were displayed on Queen's wharf from April 21 until December 7, with much benefit to shipping.

The precipitation for the year was 32.92 inches, being 3½ inches more than in 1908.

The receipts for the year were \$13,634.50, and the expenditure for the year \$10,875.34, leaving a balance of \$2,758.19.



BELLEVILLE HARBOUR COMMISSION.

Navigation opened on April 8, and closed on December 10.

The receipts for the year were.. . . .	\$3,080 64
The expenditure for the year was.. . . .	2,692 01
The balance on hand.. . . .	388 63

THREE RIVERS HARBOUR COMMISSION.

The Harbour Commission of Three Rivers is composed of:—P. A. Drolet, Esq., chairman; Joseph L. Fortin, Esq., P. L. Lassonde, Esq., L. E. Dufresne, Esq., L. P. Normand, Esq., George Balcer, secretary.

The present wharf accommodation extends from the western bank of the St. Maurice river up to the ice-breaker, a distance of about 5,500 feet. Within this distance there are several wharfs; the St. Maurice Lumber Company's wharf used for local and inland waters traffic and with one berth for ocean-going steamers, the harbour commissioners' wharf with accommodation of 1,350 feet, the depth of water at the front being from 30 to 35 feet and reserved exclusively for ocean going vessels. The commissioners have another wharf, 490 feet in length with 25 feet depth of water, for vessels of inland waters, and another wharf 300 feet, with a depth of 25 feet of water; this is used by passenger and freight lines.

The Richelieu and Ontario Navigation Company's wharf is between the two last mentioned wharfs and is used by the steamers of the company.

A private wharf lies between the 300 feet wharf of the commissioners and the new government dock. This new dock is 2,000 feet long and built of concrete with a minimum depth of 30 feet of water along the front extension and intended for ocean traffic exclusively.

The top surface of the commissioners wharf varies from 200 to 275 in width and the government wharf from 200 to 300 feet, the area being over 500,000 square feet for the government dock alone.

Other wharfs are the old Grand Trunk wharf, the wharf at Cap la Magdeleine which accommodate large freight and passenger traffic.

A railway line runs along the whole water front and branches connect the port with manufacturing centres.

The port of Three Rivers is also directly connected with the most important trunk lines of the country, and facilities for loading and unloading freight from cars to the vessels and from vessels to the cars, have been provided. In the southern side of the harbour, however, there are no railway sidings.

The port is favourably situated for shipping, having a channel from 30 to 50 feet in depth along the wharfs, with very little current and a roadstead from 1,200 to 1,500 feet in width.

Total receipts for 1909.. . . .	\$20,783.71
Bal. in bank from 1908.. . . .	10,321 42
	<hr/>
	\$31,105 13
Expenditure for the year 1909.. . . .	17,482 71
	<hr/>
Balance in bank.. . . .	\$13,622 42



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The business at the port of Three Rivers though not as prosperous and progressive as the commissioners would desire, yet is slowly increasing. The number of ocean steamers registered at the port during the year 1909 was forty-seven with a tonnage of 100,000 tons, an increase of three vessels and 14,000 tons over that of 1908, and of seventeen vessels and 44,000 tons over that of 1907. The lumber trade has shown the substantial increase of 4,000,000 feet over last year, the volume being 12,000,000 against 8,000,000 in the previous year, and the commissioners hope a still larger shipment next year owing to the increasing demand in Britain. Besides the shipments by ocean vessels as related above, 100,000 cars of pulpwood and 25,000,000 feet of lumber were shipped from the ports and outports of Three Rivers to the United States by water during the year 1909.

## THE PICTOU HARBOUR COMMISSION.

British vessels numbering 883, with a tonnage of 188,029 tons, and sixteen foreign with a tonnage of 18,338 tons, a total of 899 vessels and 206,367 tons reported at customs inwards during the year and 895 British and nineteen foreign with a total tonnage of 204,295 tons entered outwards.

Fourteen vessels with 6,329 tons, from foreign countries entered inwards and nine with 10,066 tons entered outwards.

4,871,251 superficial feet of spruce deals, were shipped, value \$68,721.

Of coal, 1,412 tons, value \$3,888, and general merchandise value, \$6,262, were exported by water during the year.

The imports by water amounted in all to \$11,577.

## NORTH SYDNEY HARBOUR COMMISSION.

The shipping was: ocean steamers numbering 983, of 1,277,907 tons registered, 196 coasting steamers of 49,072 tons register; 1,046 sailing vessels of 66,640 tons register, a total of 2,225 vessels and 1,393,619 tons. This shows an increase of forty-one vessels and 182,062 tonnage over last year notwithstanding the hindrance to traffic caused by the strike at the Dominion Coal Company's works.

The Dominion Coal Company shipped by water 1,260,000 tons of coal.

The Nova Scotia Steel and Coal Company shipped 524,064 tons.

The Nova Scotia Steel and Coal Company imported 116,268 tons ore.

The Dominion Iron and Steel Company imported 545,640 tons ore, 212,827 tons of limestone, 99,202 tons coal and 31,315 tons of general cargo.)

## LIFE-SAVING SERVICE.

The life-saving service of the department, in the past, has considered a number of stations supplied with life-saving apparatus considered sufficient to render ordinary assistance to vessels ashore or needing help when in distress along our shores. The boats are principally Beebe-McClellan self-bailing surf boats and in a few instances Dobbins self-righting and selfbailing boats. But the latter were found to be too heavy for the number of men generally available for volunteer crews, who are only paid for annual drills and when assistance is rendered. The Beebe-McClellan surf boats have in late years been supplied the stations.



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At several of the stations on the Atlantic coast and British Columbia lyle guns, breeches buoys, and rocket apparatus have been supplied. Wagons have also been furnished some stations, for conveying boats and guns to a distance along the shore.

During the year 1909, more attention than formerly has been given to instruction in the use of the lyle guns, breeches buoys and in drilling generally in the special service of life saving. In a few instances, owners of gasolene fishing boats have been given an allowance for performing service throughout the season.

In one case, near Brier island, a schooner was towed out of danger into safety by a motor fishing boat.

A new motor life-boat was built for the Banfield Creek station, British Columbia, and placed upon the station. This boat replaced one that was wrecked in 1908 and cost \$11,184.52.

The report of Rear Admiral Kingsmill which forms Appendix No. 13 of this report relates the special inspection of stations made by different officers in the maritime provinces and Great Lake districts. During the season, Commander H. Thompson, R.N., of the department was directed to visit certain stations and report upon the efficiency of the equipment and their condition, and also to instruct the new crews in the use of lyle guns, rockets and breeches buoys.

The expenditure for the fiscal year, was \$34,756.35. which includes \$1,004.41 expended this season on the trail built at a total expenditure of \$25,665.87 by the department to Banfield Creek station, British Columbia.

#### NAVAL DEPARTMENT.

As a result of the attendance of yourself and colleagues, the Minister of Militia, at the Imperial Conference, held in London, in July and August, 1909, relating to the formation of colonial navies, the government of Canada decided upon the establishment of a Canadian navy. The technical advisers of the Canadian representatives were Major General Sir P. H. N. Lake, K.C.M.G., C.B., and Rear Admiral C. E. Kingsmill. The proposal to purchase two training ships, one for the Atlantic coast and one for the Pacific coast, resulted in negotiations being entered into with the imperial government to purchase the *Niobe*, a first class cruiser for £215,000, and the *Rainbow*, a second class cruiser for £50,000 to be ratified by parliament.

During the session of parliament a Bill was introduced to provide for the establishment of a Canadian navy and was still before the House at the end of the fiscal year. Further particulars on the subject of the Canadian navy will be found in the report of Rear Admiral Kingsmill, which forms Appendix No. 9 of this report.

Pending the passage of the Naval Bill, steps were taken to form a department to administer the Canadian navy, this department to be called the Department of the Naval Service, and estimates were introduced providing for the salaries of officers of that department. It was also decided that several branches of the department should be detached from the Marine Branch and the Fisheries Branch of the department to be embraced in the Department of the Naval Service. The branches of the service which will, therefore, be attached are wireless telegraphy, hydrographic survey, tidal survey, naval militia and fisheries protection service. It was decided that a separate deputy minister should be appointed to whom the heads of the branches mentioned would be responsible and to whom they would report.



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## STEAMBOAT INSPECTION.

All passenger steamboats over five tons gross tonnage are subject to inspection, yearly, of boilers, machinery, hulls and equipment according to the rules of steamboat inspection.

Every freight steamer of more than one hundred and fifty tons gross is subject to inspection yearly, according to the rules of steamboat inspection for boilers, machinery, and hulls.

Freight steamers, tug boats and steamers used for fishing purposes, under one hundred and fifty tons and more than five tons gross tonnage are subject to inspection of boilers and machinery, according to the rules of steamboat inspection.

At present, there is no fee charged for inspection except upon steamers registered elsewhere than in Canada when engaged in carrying passengers between Canadian ports and not holding a British Board of Trade certificate. The fee is then in Canada eight cents on the gross tonnage of such foreign steamer.

Canadian registered vessels inspected during the fiscal year numbered 1,978, gross tonnage, 440,819. Vessels inspected, but not registered in the Dominion, numbered 162, gross tonnage 238,227 tons. The amount of fees collected for inspection was \$6,369.60.

The total expenditure in connection with inspection amounted to \$40,782.77, but part of this expenditure was for Dominion steamers and fog-alarms. The report of the chairman of steamboat inspection forms Appendix No. 10.

## STEAMBOAT INSPECTORS.

Edward Adams, Chairman.....	Ottawa, Ont.
J. A. Thomson.....	Victoria, B.C.
H. G. Robinson.....	Vancouver, B.C.
W. J. Cullum.....	Victoria, B.C.
G. P. Phillips.....	Kenora, Ont.
J. Dodds.....	Toronto, Ont.
J. B. Stewart.....	Toronto, Ont.
E. W. McKean.....	Collingwood, Ont.
T. P. Thompson.....	Kingston, Ont.
W. Laurie.....	Montreal, Que.
L. Arpin.....	Montreal, Que.
F. X. Hamelin.....	Sorel, Que.
N. A. Currie.....	Halifax, N.S.
C. E. Dalton.....	St. John, N.B.
J. H. Fontaine.....	Quebec, Que.

## HULL INSPECTORS.

J. C. Kinghorn.....	Victoria, B.C.
W. Evans.....	Toronto, Ont.
M. R. Davis.....	Kingston, Ont.
P. Duclos.....	Quebec, Que.
C. W. Seeley.....	Halifax, N.S.
I. J. Olive.....	St. John, N.B.
S. D. Andrews.....	Collingwood, Ont.



## MERCHANT SHIPPING.

Supplements to the list of shipping are published every month, and those affecting this list which have been issued up to date, are bound in the Shipping List.

The total number of vessels remaining on the register books of the Dominion on December 31, 1909, was 7,768, measuring 718,533 tons, being an increase of 166 vessels and 16,229 tons, as compared with 1908. The number of steamers on the register books on the same date was 3,229, with a gross tonnage of 513,962. Assuming the average value to be \$30 per ton the value of the net registered tonnage of Canada on December 31, 1909, was \$21,556,590.

The number of new vessels built and registered in the Dominion of Canada during last year was 327, measuring 25,306 tons net register. Estimating the value of the new tonnage at \$45 per ton gives a total value of \$1,138,770 for new vessels.

During the year, Prince Rupert, in the Province of British Columbia, was constituted a port of registry for ships.

During the year, 246 vessels were removed from the register books, and a detailed statement is given in the List of Shipping showing the cause of their removal.

It is estimated that 36,430 men and boys, &c., inclusive of the masters, were employed on ships registered in Canada, during the year 1909.

## RADIO-TELEGRAPHIC SERVICE.

During the fiscal year, three new stations were established and completely equipped, making a total of twenty-nine public stations in Canada. The three new stations were erected in British Columbia, at a total cost of \$36,205.72; one on Triangle island north-west of Cape Scott, Vancouver island; one on Ikeda Head, Moresby island, and one at Prince Rupert, making a complete chain from Victoria, along the west coast of Vancouver island and the east coast of Queen Charlotte islands to Prince Rupert. Vessels passing on the outside of Vancouver Island are never outside the range of communication between Victoria and Prince Rupert. Vessels passing from Vancouver to Prince Rupert in the inside channels can, with the exception of two short interruptions, put themselves in communication all along the route.

Improvements were made at Victoria, Pachena, Point Grey and Estevan stations on the Pacific coast, and at Whittle Rocks, Gulf of St. Lawrence, Harrington, P.Q., and Belle isle, at a total cost of \$13,648.64.

There are eight stations in British Columbia, all owned and operated by the department at which 18,469 messages were sent and received, consisting of 265,414 words. The cost of maintenance was \$12,320.82 for the fiscal year. The range of communication at these stations varies from 350 miles at Triangle island to 100 miles at Point Grey and Cape Lazo.

In eastern Canada, fifteen stations are owned and operated by the department which received and sent 50,157 messages containing a total of 784,015 words. The cost of maintenance of the eastern stations owned by the department, was \$47,533.70. The range of communication is from 400 miles at Cape Race, Newfoundland, to 150 miles at Cape Bear, Prince Edward Island and Harrington, P.Q.

Two land stations owned by the Marconi Wireless Telegraph Company were operated under contract to the department at a cost of \$3,500. The number of messages



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sent and received was 579, and of words, 7,199. These stations are at North Sydney and Pictou, and the range of communication is one hundred miles.

There are four land stations owned and operated by the Marconi Wireless Telegraph Company, viz.:—at Montreal, Three Rivers, P.Q., Camperdown, N.S., and Sable island, N.S. These stations sent and received 14,872 messages containing 165,156 words.

Two stations are owned by the Public Works Department and also operated by the Marconi Wireless Telegraph Company. The stations are at Quebec and Grosse Isle each of which has a range of communication of one hundred miles.

It will be seen that the expenditure for the above service was \$113,208.88.

The Dominion steamers equipped with wireless apparatus are—the *Quadra*, range 100 miles; *Minto*, 150 miles; *Stanley*, 150 miles; *Lady Laurier*, 150 miles; *Aberdeen*, 100 miles; *Druid*, 100 miles; *Earl Grey*, 200 miles; *Montcalm*, 150 miles; *Canada*, 100 miles.

The total expenditure for the fiscal year, in connection with the Radio-telegraphic service, was \$116,477.37.

Particulars of this service will be found in the report of the Government Superintendent of Wireless Stations, Appendix No. 12.

## SABLE ISLAND HUMANE INSTITUTION.

The report of the Superintendent of Sable Island Humane Institution was made to the agent of the department at Halifax and forwarded to the department.

The report is brief and contains, practically, information of the same nature as the report of 1908.

Sable Island has for many years had the reputation of being one of the most dangerous places in the north Atlantic for approaching vessels, but in recent years no wrecks have occurred in the immediate vicinity of the island.

The practice of patrolling the island was kept up during the year of 1909. Repairs were made to buildings in order to maintain the humane institution in a proper and serviceable state.

Situated as Sable Island is, in the Atlantic ocean, it would be quite reasonable to suppose that hay and vegetables would have sufficient moisture for their growth, but the season of 1909 was so dry that only a moderate growth occurred in connection with the farming operations.

At the close of the season, the live stock on the island consisted of sixty-five head of cattle, thirty trained horses, two imported stallions and five imported mares, two hundred wild ponies and five hogs. The shipments from the island were thirty-two wild ponies, 109 barrels of cranberries and some hides.

The population consists of the superintendent, keepers of light stations, Marconi wireless stations, boatmen at the life-saving stations and their families, numbering in all, thirty.

The report of the superintendent forms Appendix No. 21, of this report.

## SIGNAL SERVICE.

The signal service of Canada as it is now established was carried on in 1909 as usual. The superintendent of signal service at Quebec has under his supervision a



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number of stations in the Gulf and River St. Lawrence and Strait of Belle Isle. From these stations daily reports are received concerning the weather and movements of vessels. Ice conditions are also noted and reported in the season, when moving ice forms a danger to navigation. Bulletins were issued at Quebec to vessel owners, agents and others interested in shipping, and telephoned to the Board of Trade, Montreal Shipping Federation, and others. The quarantine station at Grosse Isle and the pilot station at Father Point, were daily informed of the movements of inward bound vessels.

A new station was established at Cape Salmon lighthouse half way between Father Point and Quebec. The old stone tower at Verchères has been used as a signal station. The office of the signal station in Montreal was transferred from the Harbour Commissioners building to 223 Commissioner street, the office of the Montreal agency of the department.

The telephone service in connection with signal service extends from Montreal to Quebec over a rented line and from Quebec to Crane island over the public service line. It has proven of great value to the dredging fleet and to pilots, who are kept informed of movements of vessels, doing away with the former uncertainty of the whereabouts of vessels and preventing delays to both vessels and pilots.

The first steamer left Quebec on March 24, 1909, and made her trip arriving back on the 30th of the same month. Navigation was open between Montreal and Quebec, but the first transatlantic vessel to arrive at Montreal was the *Corinthian* on May 1. The last vessel to leave Quebec was the *Fornebo* on December 4, but the last transatlantic vessels left Montreal and Quebec on November 26. The *Montcalm*, however, left Quebec for Seven islands on December 18 and returned on the 23rd. The same steamer left Quebec in the spring of 1910 for the same place on March 3, and returned on the 6th of the same month.

The ice conditions were rather more favourable for navigation in 1909 than usual with the exception of the large number of icebergs which passed Cape Race station on the Newfoundland coast. The icebergs were first seen in the beginning of April and continued running until the middle of August.

During the winter of 1909-10, in the River and Gulf of St. Lawrence, navigation was more easily accomplished than for many years. Ice, weather and wind conditions were noted and information relating to seals was collected from various points in the gulf during February and March and wired to Halifax and St. John, Newfoundland, for the benefit of the sealing fleets.

Wireless telegraph messages were sent and received from the different wireless stations relating to weather conditions and movements of steamers.

The signal service includes the signalling of vessels passing certain points where signal officers are stationed. At the Halifax citadel the number of vessels of different kinds signalled was 1,432, and the superintendent has furnished a classified report of the vessels, principally steamers. Reports have also been received from the signal officers at Cape Race, Newfoundland, and in Nova Scotia from St. Pauls island, and Westport, Brier island. These reports contain information respecting the kind of service rendered in some cases and in others, details of signals made a certain vessel named. In New Brunswick, the lightkeeper on Partridge island signals vessels bound



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for St. John and on the north side of the province signal stations exist at Point Lepreaux, Escuminac and Chatham, the last place is in the Miramichi river.

The reports received by the department on the signal service will be found in Appendix No. 19 of this report.

## WORKSHOPS.

Workshops are maintained by the department at Sorel, Halifax, Quebec, Prescott and Parry Sound. The workshops at Sorel are of course the most important as construction of vessels is carried on at the shipyard as well as the making of repairs to vessels. Several separate buildings have, from time to time, been erected for the proper division and performance of the work. The buildings consist mainly of the office, draughting room and general store, boiler shop, machine shop and power-house for electric plant, blacksmith shop, joiner shop, boat building and general wood-work shop, sawmill including planing machine and moulding machinery, pattern shop and vessel moulds and sail loft, tinsmith shop, building for storing vessels equipment and stables. In addition, there is a fire equipment, a narrow gauge railway with sheds, also a railway track from the Sorel railway station for freight cars.

At the Dominion lighthouse depot, Prescott, the shops are mostly within the main building. It contains the main office, draughting room, photometric room where tests are made of lighthouse apparatus, carpenter shop, pattern shop, blacksmith shop, vapour lamp and erecting department, paint shop, shipping department and general store. The machine shop and acetylene department are each in separate buildings. The number of workshops at Quebec is seven, viz., the boiler shop and forge, machine shop, tinsmith and plumber shop, carpenter and boat shop, joiner shop, paint shop and sail loft.

At Halifax, the workshops are connected with the dockyard and are mainly a blacksmith shop, carpenter and boat shop, machine shop, paint shop and tinsmith shop. Extensive repairs are made to buoys and moorings and repairs to the machinery of the Dominion steamers.

At Parry Sound, the depot is mainly used for storing acetylene, gas buoys and lighthouse tanks and charging them with acetylene. The buoys and tanks are painted and prepared for placing in the spring; a few mechanics are consequently employed at this depot.

## ICE PHENOMENA IN THE ST. LAWRENCE RIVER.

Ice conditions were studied at Cap Rouge, a narrow part of the St. Lawrence river where large bodies of running ice are usually held and form a barrier in the early part of the winter. The effect in past years has been to prolong the duration of the ice above Cap Rouge and the overflowing of the banks of the river near that point. In the winter of 1908-9, the accumulation of ice reached a depth of 40 feet and required the steady and persistent efforts of the ice-breaker *Montcalm* for over two months to remove it. This was done successfully by ramming and cutting a channel of about 1,200 feet in width. The ice jam was thus relieved and detached bodies were floated down the river towards the sea by the force of the current. The overflowing of the banks of the river was prevented and navigation was opened three weeks earlier



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than if the ice disappeared by natural disintegration. It was decided to begin the operations of removing the ice at an earlier period in 1909-10 and prevent a similar accumulation to that of previous years. For this purpose both the *Montcalm* and *Lady Grey* were put at the work of clearing the ice before a jam of any consequence could occur. The experiment was satisfactory in its results, but it must, however, be stated that the extraordinary mild winter was most favourable for carrying out the work of keeping the channel open.

The formation of the ice itself and its movements from the upper waters of the river and lakes above, formed a subject of special study by H. T. Barnes, D.Sc., F.R.S.C., F.R., Met. Soc. Director of the Physical Laboratories and Macdonald Professor of Physics, McGill University, who has given his attention to ice phenomena. To aid his scientific efforts in this direction, Louis Vessot King, B.A., was employed on board the *Montcalm* and *Lady Grey* to make daily observations and was therefore associated with Prof. Barnes.

In a full report to the department, Prof. Barnes states, 'that an excellent opportunity was afforded for studying the desintegration of ice at Lake St. Peter.' The 'preventive measures' taken at Cap Rouge in 1909-10, leads him to conclude that satisfactory results would follow similar efforts every winter. As pointed out in the report of Prof. Barnes published last year, frazil ice was one of the chief difficulties met by the *Montcalm* in 1908-9. Its tendency to cling to the bottom and along the water lines of the steamer was most marked. The effect of frazil during the last winter was not great as it did not appear to the same extent as in more severe seasons—in fact, at no time was frazil troublesome. This is accounted for by the higher temperature of the water, due, it is stated, by Prof. Barnes, to the effect of the sun upon so much open water as was present in the river above Quebec, during the season. Much time was spent by Mr. King in studying the effect of the sun on open water. Prof. Barnes in referring to large bodies of open water presents his views as follows:—'The whole effect of surface ice on the temperature of large masses of water is presented in a new light when considered with reference to the absorption of the sun's heat. I am convinced that the task at Quebec was rendered much easier, owing to the presence of open water above. My whole fear had been that open water would have acted in quite a different way. Mr. King devoted a great deal of time to studying the effect of the sun on the temperature of the water and some important meteorological results are likely to arise from these observations.

#### NEW MARINE THERMOMETER.

Prof. Barnes states that one of the most important developments resulting from the study of ice conditions, was the perfection of a new type of marine thermometer, which was specially designed for obtaining small variations in water temperature from the ship when going at full speed. It was made possible to accurately record temperatures to  $\frac{1}{1000}$  of a degree centigrade, over a wide area. The thermometer is of the electrical resistance type, in which the variations of resistance of a metal wire, serve to give a measure of the changes of temperature of the medium in which the instrument is placed. In the report it is stated the results arrived at from its use are satisfactory. It is asserted by Prof. Barnes, that the instrument can be made very useful in obtaining useful information on a survey of the ocean. It has also been brought by recent



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development, to a state in which by means of a suitable modification and combination of a calendar recorder, and the wire bridge used by himself and Mr. King, to record to  $\frac{1}{100}$  of a degree, automatically. Further particulars respecting this invention are given in the report, which will be published as a supplement to this report, with illustrations of the thermometer and diagrams of curves, showing the effect of days of bright sunshine on weakening ice. An interesting fact was the observance of the effect upon the temperature of the water in streaks, when the sun shone upon the water through rifts of the clouds.

The report is divided into the following sections, viz.:—

General meteorological conditions and extracts from the reports submitted by Mr. King on ice conditions during the winter.

Measurements of water temperatures to a thousandth part of a degree by means of a new marine thermometer.

Effect of the sun on the general ice conditions. The absorption of the solar heat by the water.

The influence of ice on the temperature of the water.

The rate of growth of surface ice.

Some problems affecting the maintenance of an open channel between Montreal and Quebec during winter.

The report is one of great interest and value, not only to all who may be interested in the navigation of the St. Lawrence river during winter or the early navigation of the river in spring by sea-going vessels, but is a valuable contribution to the scientific study of ice phenomena. As already stated in this brief summary, the report will appear as a supplement to this report and it is expected the publication will take place at an early date.

## INSPECTION OF LIVE STOCK SHIPMENTS.

The inspectors of live stock shipments have reported regularly and furnished a statement of cattle, sheep, horses, hay and grain shipped to the United Kingdom from the ports of Montreal and St. John, N.B.

It will be seen that the total number of cattle and sheep shipped was less than last year and much less than previous years, going as far back as 1902-3.

The shipments from Montreal were as follows:—Cattle, 94,314; sheep, 1,616, and 286 horses. The United States cattle shipped via Montreal were 7,227, but that number is included in the total of 94,314.

The shipments from St. John, N.B., were 4,632 cattle, no sheep nor horses, nor were any United States cattle shipped from that port.

The statement of live stock shipments forms Appendix No. 20 to this report.

## LEGISLATION.

Subsection 4 of Section 9 of the Fisheries Act, chapter 45 of the Revised Statutes is repealed; section 17 of the same Act is repealed and another section substituted, relating to the boundaries of estuary fishing; section 20 of the same Act is repealed and another section substituted relating to space between nets and dimensions of nets; sections 22 and 30 of the same Act are repealed.



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Subsection 5, of section 47 of the said Act, is repealed and a new section substituted relating to devices to prevent passage of fish; subsection 14 of section 47 of the same Act was amended relating to the free passage of fish from Saturday p.m. to Monday, a.m.; section 48 of the same Act was repealed and a new section substituted, relating to purse seines; section 50 of the same Act was repealed and a new section substituted relating to fish-guards in British Columbia, Manitoba, Saskatchewan, Alberta, Northwest Territories and Yukon.

Section 51, of the same Act is repealed and a new section substituted, relating to permits required to catch, trade in or export fish for manure; section 78, of the said Act, is repealed and a new section substituted, relating to 'failure of owner or manager of lobster factory to send returns to minister'; section 92, of the same Act, is repealed and a new section substituted, respecting confiscation of all fishing property used and all fish taken, bought or sold, in violation of Act; section 94, of the same Act, is repealed and a new section substituted, respecting penalties not otherwise provided for.

Provision, was also made in the same Act, for bringing into force international fishery regulations by proclamation of the Governor General in Council.

Chapter 53, 9-10, Edward VII. An Act to authorize the erection of certain wharfs and buildings in the harbour of St. John.

Chapter 43, 9-10, Edward VII, An Act respecting the Naval Service of Canada.

Sections 4 and 5 of The Navigable Waters Protection Act, chapter 115 of the Revised Statutes, 1906, are repealed and new sections substituted respecting the construction of bridges, booms, wharfs, &c., and removal of unauthorized structures.

Chapter 40, 9-10, Edward VII, An Act to provide for further advances to the Harbour Commissioners of Montreal.

G. J. DESBARATS,

*Deputy Minister of Marine and Fisheries.*



## APPENDIX No. 1.

ANNUAL REPORT OF THE CHIEF ENGINEER OF THE DEPARTMENT  
OF MARINE AND FISHERIES.

The Deputy Minister of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the following report of the work done in the several services under the supervision of this office during the twelve months ended March 31, 1910.

This embraces work done at departmental headquarters on the construction of lighthouses, lightships and fog-alarms, the supervision of construction and repairs of lifeboats; the administration of the vote for the removal of wrecks and obstructions in navigable waters; tidal and current surveys; and the publication, examination and correction of hydrographic charts; construction of and repairs to fish hatcheries and refrigerators; engineering points in connection with the construction and maintenance of fish-passes; supervision of surveys of oyster beds; examination of applications for foreshore, wharf and other water lots as they affect the interests of navigation; preparation and publication of notices to mariners and hydrographic notes, &c.

## STAFF.

There is a special staff appointed for the tidal and current survey work; the remainder of the work of the branch is attended to by the general staff of the office.

The following changes have been made during the year in the staff of my office:—

Mr. E. M. Longtin, engaged temporarily as resident engineer for the Montreal district, returned to Ottawa on August 23, 1909, for duty in the draughting room, and was replaced at Montreal by Mr. A. Laforest.

Mr. H. Killeen has been, since April 6, 1909, employed as resident engineer for the province of British Columbia.

Mr. F. J. Alexander, architect, has since January 1, 1910, been assigned for duty with the Naval Department, and has been engaged in preparing preliminary sketches for the proposed college buildings, &c.

Mr. A. Fortey has since July 28, 1909, been employed as a draughtsman, on temporary work.

As in previous years, members of the office staff have been utilized to superintend construction works, where resident engineers or competent foremen were not available, and although it is difficult to spare them from the draughting room, the practical knowledge of work gained by such utilization of draughtsmen is a compensating advantage. The following cases of such supervision by my staff deserve mention:—

Mr. F. P. Jennings was engaged in 1909 in erecting a reinforced concrete lighthouse on the pier at Burlington, Ont., and completed the work satisfactorily and within the estimate. In February last he was sent to Prince Rupert to obtain the details required for the establishment there of a departmental wharf, store, and buoy depot.

Mr. H. de Miffonis superintended the construction of a reinforced concrete pier at Pointe du Lac, to replace the pier overturned by ice in 1908, and designed a special structure of light weight, with a large base, to meet the difficult conditions existing at that place.



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It is with great sorrow that I have to record the loss by death of the services of Mr. J. F. Murphy, resident engineer of the Ontario district. Mr. Murphy had been very energetically engaged in organizing the work in his district, and in getting the new construction steamer *Lambton* prepared for commission. In June last I accompanied him on his initial inspection trip on that boat; only a few days later he returned to Ottawa ill, and on July 26, succumbed to an attack of typhoid fever. I desire to bear testimony to his good qualities both of heart and head; and I am sure the department lost, in him, one of its most promising officers.

#### PERSONAL INSPECTIONS.

Personal inspections of construction work in progress have frequently been made during the year by Mr. Fraser and myself, and it is very desirable that such personal supervision of work should be extended as much as possible in the interests of efficiency. Examination of localities where work is proposed should always be made before the plans are prepared and in the interests of both efficiency and economy it is to be regretted that the work, lately, has often been so much rushed as to prevent such preliminary inspections.

The principal inspection trips made by me during the past year were:—

An inspection of the ice jam in the Niagara river in the month of April, for the purpose of reporting on possible remedial measures.

An early inspection of the work on the River St. Lawrence below Quebec, and especially of the work under construction at Cape Dogs, which may be considered a model, modern installation.

From June 9 to 25, I accompanied Mr. Murphy, on the new steamer *Lambton*, on an inspection trip of all light-stations, &c., from Prescott to Port Elgin.

From July 6 to August 3, I made an inspection, accompanied by Mr. P. E. Parent, resident engineer, Quebec district, and Mr. F. Macdonnell, inspector of fog-alarms, of all the light and fog-alarm stations in the Gulf of St. Lawrence and Strait of Belle Isle, and on the Saguenay river, when I had an opportunity of seeing the great improvements that had been made in this section under my directions and those of the acting commissioner of lights.

In August, I attended at Winnipeg the meeting of the British Association for the Advancement of Science, at which I presented by request a paper on the St. Lawrence route, with special reference to the improvement of the channel and of aids to navigation. On my return I joined the *Lambton* at Fort William, and inspected all our stations to Parry Sound, specially examining Michipicoten island, with the aim of choosing the best location for the contemplated lighthouse.

In the late autumn I made a special inspection of aids to navigation on the Georgian bay, and took the opportunity, with the aid of Captain W. A. Richmond, who has a thorough knowledge of the intricate inner channels, to obtain the information for a complete list of buoys and day beacons in Lake Huron and its contributory waters.

In December, an inspection and trial trip was made of a new motor lifeboat built by the Electric Launch Company of Bayonne, N.J., as a result of which she was accepted and shipped by rail to British Columbia.

In January, 1910, I accompanied Commander Stewart, R.N., to Halifax, to examine the Admiralty property there, and report on its suitability for conversion into grounds for the contemplated Canadian Naval College.

Numerous short inspection and business trips were also made throughout the year.

Mr. Fraser, assistant chief engineer, was sent to British Columbia in March, 1909, to lay out the season's construction work and give necessary instructions to Mr. Killeen, the newly appointed resident engineer. He visited all points where work was to be done, making examinations and surveys at Triangle island, Lawyer island,



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Quatsino and Ivory islands; he arranged for the completion of the 100-foot concrete tower at Estevan point, and the construction of the new fog-alarms at Carmanah and Race rocks; he also examined the West coast trail, and arranged for a continuation of the work. At Prince Rupert he made a preliminary location and survey of a proposed new departmental depot.

At the close of the season he returned to British Columbia to inspect the work placed in Mr. Killeen's charge, and to examine the progress on the West coast trail. He made suggestions for the continuation of this work, and the maintenance of the life-saving service during the winter months, which were approved and carried out.

## OFFICE WORK.

A large proportion of the work done by the general staff of the branch consists in the construction, repair or improvement of light buildings, fog-alarms, beacons and other aids to navigation. Full details of the work done in this connection during the past twelve months are contained in a separate report which is attached hereto. (Inclosure A.)

Plans and specifications for all important new buildings and repairs, new vessels, &c., are made or approved in this office.

The following table indicates the work done in the draughting office during the twelve months ended March 31, 1910:—

Description of Work.	Plans Designed.	Plans Received.	Copies Made.
Lighthouse towers and dwellings. ....	25	6	127
Fog alarm buildings. ....	4	—	17
Details. ....	48	18	224
Wharfs, piers, &c. ....	4	9	22
Outbuildings. ....	3	6	35
Machinery. ....	1	5	9
Lanterns and illuminating apparatus. ....	—	2	3
Buoys and apparatus. ....	2	3	24
Charts under construction. ....	1	—	—
Steamers. ....	—	5	—
Land surveys. ....	4	30	52
Plans relating to water applications. ....	—	272	44
Miscellaneous. ....	23	208	185
	115	564	742

Total plans for twelve months from April 1, 1909 to March 31, 1910. ....	1,421
Charts received and recorded. ....	168
Charts received and entered in chart books. ....	21
Photographs received and recorded. ....	164
Specifications written. ....	43
Notices to mariners issued (comprising 337 subjects). ....	130

## PUBLICATIONS.

The work of preparing and issuing notices to mariners continues to be heavy and urgent; during the past twelve months 130 notices, covering 337 subjects, have been published. Amongst important notices, involving considerable labour in compilation, and representing useful work done in the department, are:—

A complete list of the buoyage of Lake St. Louis, St. Lawrence ship channel; depth of water in the harbours of Lake Ontario and Georgian bay, and other hydrographic notes respecting the same; also soundings, observations on the currents and warning to mariners respecting the currents off Matane and Ste. Félicité, St. Lawrence ship channel.



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During the past twelve months notices relating to waters outside of Canada were issued, covering 13 items relating to Newfoundland and Labrador, 1 item relating to the Atlantic, 7 to the inland, and 6 to the Pacific waters of the United States, as well as 13 notices referring to transatlantic and 1 notice referring to transpacific subjects. No attempt is made to issue a complete synopsis of British or foreign notices, but merely to republish items likely to be of immediate interest to Canadian vessels, or to vessels leaving Canadian ports for the more important or frequented foreign ports.

#### CLASSIFICATION OF LIGHTKEEPERS' SALARIES.

An important detail of office work that should have been mentioned in my report of last year was the classification of lightkeepers' salaries. In February, 1907, a conference of agents and inspectors of lights of this department with the headquarters staff was held in Ottawa, and at that conference it was recommended to the minister that lightkeepers should be classified in accordance with the value of the services rendered in each case. A provisional classification was suggested by the conference, but in working out the details it was found that there were not sufficient classes provided, and that the gaps between the classes were too large, to include the great variety of lights covered by the thousand stations maintained in the Dominion of Canada.

The work was not properly a function of my branch, but the minister requested that I should prepare a scheme of classification in consequence of my intimate familiarity with all the stations in the Dominion. This work was completed in September, 1908, and the results embodied in an order in council, passed on September 24, 1908, reading as follows:—

‘The Treasury Board has under consideration a memorandum from the Minister of Marine and Fisheries representing that it is in the interest of the service to classify light-stations in the Dominion, and to pay salaries based on such classification; that if such classification were made it would facilitate the machinery of lighthouse maintenance, remove many causes of complaint and prevent errors, and further that such a scheme would include a progressive increase in salary through a short period of years from a minimum to a maximum for each class; that he has caused to be prepared a classification; that all the stations in the Dominion are divided into nineteen classes as under, and regulations are submitted as well as a complete list of all light and fog alarm stations in the Dominion, placed in their proper classes.

‘The minister states that the adoption of this classification will involve an addition to existing salaries aggregating about ten per cent for the present year, the money for which has been voted by parliament and is available; that for each of the two succeeding years, 1909 and 1910, the annual increases proposed to operate the schedule would involve increases in the vote for salaries of lightkeepers of about five per cent each year. After 1910 the keepers will have reached the maximum of the classes, and no further increase in the vote will be requisite except to provide for new stations.

‘The Treasury Board recommend that the following schedule classification of classification of light and fog alarm stations, and regulations for the application of schedule of classified salaries be adopted to go into effect from April 1, 1908, and that when new keepers are appointed to existing stations they shall come immediately under the operation of the schedule, and that when new stations are put in operation the order in council appointing the first keeper shall also classify the station.’

Accompanying the order in council where regulations for the application of the schedule, and also a schedule of classification as follows:—



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## SCHEDULE OF CLASSIFICATION OF LIGHTS AND FOG-ALARM STATIONS.

Class No.	Description of Aids.	Minimum.	Annual Increase.	Maximum.
<i>Combined Light and Fog Alarm Stations.</i>				
1	Humane establishments, power lightships, and the largest rock stations .....	Varied to suit the several cases.		
2	Main sea-coast lights with fog alarms, requiring engineer and two assistants.....	\$1,000	\$50	\$1,200
3	Main sea-coast lights with smaller fog alarms, requiring engineer and one assistant. ....	800	40	960
4	Secondary sea-coast lights, with smaller fog alarms, requiring one engineer and one assistant.....	680	40	800
5	Isolated Gulf stations with explosive signals, and other stations requiring lightkeeper and one assistant.....	610	30	700
6	Smaller lightstations with fog alarms, requiring one engineer	540	25	640
<i>Lightstations Only.</i>				
7	Important sea-coast lights in isolated positions, including a few grouped lights.....	450	20	530
8	Revolving sea and lake coast lights, fixed lights difficult of access and grouped lights .....	380	20	460
9	Coast lights involving boating or isolation. (In some Ontario stations, lights are grouped).....	340	15	400
10	Remoter coast lights and revolving lights of minor importance, with a few grouped minor lights.....	300	15	360
11	Small lights taking most of a man's time, usually involving residence .....	240	15	300
<i>Minor Stations where the exclusive services of the Keeper are not expected.</i>				
12	Coast lights and range lights involving boating or residence	180	15	240
13	Minor coast lights, river lights, on piers and range lights..	150	10	180
14	Small coast lights, important river lights and range lights..	120	10	150
15	Smallest coast lights, river lights involving care from a distance, and small range lights. ....	100	10	130
16	River lights in somewhat difficult situation.....	80	5	100
17	Smallest river lights.....	60	5	80
18	Wharf and fishing lights.....	50	5	65
19	Contract lit lights.....	Amount of contract.		

Every light and fog-alarm station in the Dominion was brought under the operation of this schedule, with gratifying results, in that it provided an increase in salary varying from 10 to 20 per cent, gave employees an assurance of stability which they did not previously possess, and relieved the department from constant demands for increases of salary. The schedule was this year printed, under my supervision, for the information of the officials concerned, and will hereafter be reissued to contain orders in council making new appointments.

## REMOVAL OF OBSTRUCTIONS.

During the past twelve months the following work has been done, under the annual appropriation for the removal of wrecks and obstructions:—

The barque *Warren*, which sank in the harbour of Pugwash, N.S., was removed by contract by Messrs. A. Hollis and Peter F. McLean, of Pugwash, N.S., for \$1,200.

The schooner *M. C. McLean*, which sank near the wharf at Baddeck, N.S., was removed by contract by Mr. J. McIntyre, of Baddeck, N.S., for \$250.



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The schooner *Benson*, which sank in Colpoy bay, Wiarton, Ont., was removed by contract by Mr. J. C. Johnson, of Wiarton, Ont., for \$1,800.

The schooner *Acacia*, which was sunk at Swims point, Clark harbour, N.S., was removed by the owners, Messrs. Brown, Smith & Nickerson, of Clark harbour, N.S., at no expense to the department.

#### HYDROGRAPHIC WORK.

The hydrographic surveys of this department are now in charge of Mr. W. J. Stewart, who will make a special report of the year's progress.

All hydrographic notes reaching the department are prepared for publication in this office, and embodied in notices to mariners.

In preparing notices to mariners, special attention has been paid to publishing all information obtainable respecting the hydrography of Canada, and the fullest possible sailing directions have been appended to all descriptions of aids to navigation so as to increase the value of these notices.

The usual annual edition of the list of lights and fog-alarms in the Dominion, corrected up to April 1, 1909, was issued during the summer, with reprints of the portions relating to the Great Lakes and British Columbia bound separately for the use of mariners in those waters. This list has now become so bulky that it ought to be permanently divided into three portions, and printed only in that form.

In last year's report I drew attention to the fact that no adequate lists of buoys in the eastern waters of Canada were published, and I now repeat my assertion that in the interests of safe navigation complete lists of buoys, beacons and day marks should be prepared and published, and kept up to date by annual revisions.

A tour of inspection of the Georgian bay last autumn, on which I took full notes of all aids inspected, gave me an opportunity of preparing, during the winter, a list of buoys and beacons in Lake Huron and Georgian bay. This has been made ready for publication and is now in the printer's hands.

I regret that the pressure of other duties prevents me from extending this useful work to cover all Canadian waters, and that with our existing staffs the work cannot be overtaken.

#### ICE-BREAKING.

Two contracts were in force, during the present season, for ice-breaking in Thunder bay and vicinity:—

(1) The Canadian Towing and Wrecking Company, Limited, of Port Arthur, entered upon the final year's term of their three years' contract with the department to keep the harbours of Port Arthur, Fort William and West Fort William open for navigation until December 17 in each year, and to open those harbours each spring in time to admit upward bound vessels to enter the harbours as soon as the Sault Ste. Marie canal should be opened for navigation. The contract price was \$30,000 per season, which included an agreement to remove all lightkeepers in the vicinity from their stations at the close of navigation in each year.

(2) A contract was entered into with the Midland Towing and Wrecking Company, Limited, of Midland, to keep the harbours of Midland and Tiffin open until the close of navigation of 1909, for \$3,200.

In both of the above cases the work was satisfactorily done, under the supervision of the harbourmasters of the respective ports.

#### TIDAL AND CURRENT SURVEY.

In this survey, under the direction of Dr. W. B. Dawson, substantial progress has been made both in the tidal branch and in the investigation of the currents. The quantity of information sent out in reply to special requests is steadily increasing.



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This is of a very varied character, including such matters as the low-water datum for hydrographic surveys, tide levels for dredging purposes, the range of the tide required in wrecking operations, water temperature desired for investigations of fish immigration, &c.; besides requests for information which can be found in reports and tide tables already published. The need for information on the tides at the smaller harbours is also constantly increasing, to meet the growing tendency to ship lumber and other produce direct from the smaller localities.

During the past year, special attention has been given to the furtherance of the survey on the Pacific coast, where additional information was much in demand. With this in view, the surveying steamer *Gulnare* was utilized for the lighthouse service; and this arrangement left the superintendent, Dr. W. B. Dawson, free, with the two most experienced assistants on the survey, to carry out further investigations on the coasts of British Columbia.

*Pacific Coast.*—The investigations on this coast had two objects in view: firstly, by placing tide gauges at carefully selected points, to obtain a basis for the determination of tidal differences at intermediate places; and secondly, to ascertain more definitely the extent of the region which can be referred to each of the principal tidal stations for which tide tables are published. The opportunity was also taken to improve the equipment at Vancouver, and to fit up a principal tidal station at Prince Rupert, the new Grand Trunk Pacific railway terminus. These plans were fully carried out. Before the season was far advanced, a series of twenty recording gauges was in simultaneous operation along the coast.

To accomplish this result, the coast was divided into two districts. The southern portion, including the west coast of Vancouver island and the Strait of Georgia, was entrusted to Mr. H. W. Jones; the northern portion, from the north end of Vancouver island, was in charge of Mr. S. C. Hayden; while the superintendent gave his personal attention to the new installations at Vancouver and Prince Rupert, the inspection of the principal stations, and other matters of a more general character.

It has now been ascertained that the whole coast of British Columbia can be referred, for tidal purposes, to three principal stations. These are: Clayoquot, on the west coast of Vancouver island; Sand Heads, which is centrally situated in the Strait of Georgia; and Port Simpson in the north. The extent of the regions which can be referred to each of these stations, will be explained in the forthcoming tide tables for 1911. Three other principal stations are maintained at Victoria, Vancouver and Prince Rupert; but these are quite unsuitable as ports of reference, owing to local conditions. They are maintained to secure a basis for tide tables, owing to the intrinsic importance of these harbours themselves. Victoria is the only one of the three to which a very limited area can be referred, in Fuca and Haro straits.

Of these six principal stations, three are in regions where the Half Tides are a dominant feature, and the other three in regions where the Springs and Neaps are sufficiently defined to be distinguishable. The tide tables published for these stations have been modified in form to correspond with these features of the tide. The tidal differences, for the numerous harbours which are referred to these tide tables, have also been classified on the same plan.

*Principal and Secondary Tidal Stations.*—The following list shows the number of principal stations maintained in continuous operation, summer and winter, as well as the new secondary stations of 1909. In addition to those here mentioned, tidal information has been obtained from the various Admiralty surveys on the Pacific coast, between 1899 and 1907, at twenty-three localities; and from our own hydrographic survey at two others. These have been treated as secondary stations, and the results worked out for practical purposes, with reference to the principal stations established by this survey.



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There have also been established in eastern Canada, forty-two secondary stations in all, in different regions; and at several of these, observations have been continued for more than one season.

*Principal Stations—*

Pacific Coast—

Clayoquot,  
Victoria,  
Sand Heads,\*  
Vancouver,  
Prince Rupert,  
Port Simpson.

Atlantic Coast—

Quebec,  
Father Point,  
Belle Isle strait,  
St. Paul island,  
Charlottetown,  
St. John, N.B.

*Secondary Stations in British Columbia—*

Banfield. In Barkley sound.  
Alberni. Head of Alberni canal.  
Port Renfrew. Mouth of Fuca strait.  
Esquimalt. (Public Works gauge.)  
Sidney. Head of Haro strait.  
New Westminster. (Public Works gauge.)  
Point Atkinson. At Caulfields.  
Lund. In Strait of Georgia.  
Bute inlet. At the head.  
Port Hardy. In Queen Charlotte sound.  
Wadhams. In Rivers inlet.  
Kildala. In Rivers inlet.  
Namu. In Fitzhugh sound.  
Bella Coola.  
Bella Bella. (McLaughlin bay.)  
Hartley bay. In Wright sound.  
Kitimat.  
Lowe inlet. Off Grenville channel.  
Claxton. Mouth of Skeena river.  
Port Essington. On Skeena river.  
Pacofi. Queen Charlotte islands.

*Observations of the Currents.*—In many of the channels and passes of British Columbia, navigation is almost wholly dependent on the time of slack water. This is chiefly because some of the most important industries of the province, notably lumber and coal, are dependent upon towing for transportation. In passes where the current run 8 or 10 knots it is only at slack water that the most powerful tugs can handle rafts or coal barges or a scow-load of freight cars.

The tables already published by this survey, showing the time of slack water in some of the leading passes, have a value to trade and commerce which can hardly be overestimated. By timing their trips accordingly, an amount of fuel is saved which would pay in one year for the cost of obtaining the information, in the inexpensive way in which it has been secured.

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\* Discontinued in 1903, after securing six years of observations.



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Similar information is much required for the passes in the network of channels opposite the north end of Vancouver island. The difficulty of obtaining observations is exceptional, however; for although the traffic through these passes is heavy, the shores are uninhabited. Detailed arrangements were made last season, with a view to observations beginning this spring; and personal explanations were given on the spot, by the superintendent, to two men who undertook to live at the required points during the coming summer season. Both these men have found it impossible to carry out the arrangement, but others have been secured by correspondence; and there is now good hope that the observations will be obtained successfully.

*Arctic Ocean.*—An important series of tidal observations was secured by the expedition in the C.G.S. *Arctic*, under Captain Bernier. They extended over four months in 1908-9, at Winter harbour on Melville island; and they are of special interest in being from the third ocean bounding the Dominion. The work is creditable, as it was continued day and night without the help of a recording instrument. The notes obtained, when handed over to this survey, were reduced to the form of tide curves; and a concise summary was prepared for Captain Bernier's report, which showed the range of the tide and explained its leading characteristics.

*The Great Lakes.*—The observations referred to in last year's report have been continued during the past season under the supervision of Professor Loudon. The water level comparisons have been extended to Lake Superior, with some measure of success. The special instruments required are provided by this survey; and a small grant for expenses is made out of its appropriation. The record of the water level in Lake Ontario, as observed at Toronto by the harbour master, is forwarded regularly to this survey.

*Tide Tables and other publications.*—The tidal information on the St. Lawrence, from Quebec to Lake St. Peter, has been revised throughout; and the comparative observations, obtained during three seasons by the hydrographic survey, have been fully worked up. The stage of the river as it falls during the season is now clearly distinguished in the tide tables from the range of the tide itself; which will give practical aid in estimating the depth available for navigation. The tide tables for Charlottetown and Prince Rupert are now deduced from actual observations in those harbours, instead of being calculated from ports of reference; and the accuracy of several other tide tables has been improved by the reduction of further observations. The number of places on the Pacific coast for which tidal differences are given has been more than doubled, by the judicious selection of observation points in the season of 1909. Some valuable information, obtained from shipmasters of long experience, regarding the currents in the offings of Vancouver island and the Queen Charlotte islands, will appear in the next tide tables.

Owing to the rapidly growing demand for tidal information on the Pacific coast, the number of tide tables issued has now reached a higher figure than for eastern Canada. In making this comparison, it should be stated that the eastern tide tables are supplemented by two pocket editions, one for Quebec and the St. Lawrence, and the other for St. John, N.B., and the Bay of Fundy. The circulation of these abridged editions has been steadily pushed, and with the help of harbour masters and customs officers, they reach all classes of mariners down to the fishermen on the coasts, by whom they are much appreciated. The number of tide-tables issued, including the abridged editions, has reached a total of 15,000.

Two 'Notices to Mariners' were issued during the year. One of these gave advance information regarding the tides in the two important river harbours of British Columbia, New Westminster on the Fraser river, and Port Essington on the Skeena; together with the characteristics of the run of the tide in the long inlets of the coast. The other notice contained a list of publications on the currents, prepared by this survey; and this has resulted in a fresh demand for them, largely from new directions, or from new companies.



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*Information Furnished.*—Now that this survey has become so widely known, a large amount of information for special purposes is asked for, by other departments and foreign countries. This information is furnished direct from the survey office, as a matter of comity. Without attempting any complete list, the following items may be mentioned as examples. During the winter, tidal record for selected periods in past years has been furnished to the Public Works Department, from all stations between Quebec and the maritime provinces, for correlation with the precise levelling under Mr. Steckel's direction. Information in special form was supplied to the hydrographic survey, for the new Sailing Directions for the St. Lawrence. Mean sea level, at Victoria and Nanaimo, was worked out for the Geological Survey, as a basis for their contoured map of Vancouver island. The relation of the low water datum to the new bench marks placed at Nanaimo by this survey, was communicated to the Admiralty. This determination has already proved indispensable for dredging operations of Nanaimo. The leading harmonic constants, which define the various types of tide on the coasts of Canada, were communicated to Dr. O. Krummel of Kiel, for publication in the forthcoming *Handbuch der Oceanographie*. A complete record of the localities at which mean sea level has now been determined by this survey, and the basis of these determinations, was prepared for the International Geodetic conference to be held this year in Europe.

The requests for tide tables and other publications of this survey, which are received almost daily, are too numerous to mention.

*Staff.*—As there are only three permanent assistants on this survey, in addition to the superintendent, the quantity of work accomplished speaks highly of their efficiency and industry. During the past season, Mr. S. C. Hayden and Mr. H. W. Jones were both engaged in the erection and supervision of the new tidal stations in British Columbia. Mr. P. M. H. LeBlanc remained at headquarters to attend to the tidal record which comes in continuously, and other office work. During the winter season, the reduction of the observations and the calculation of the tide tables are made by the same staff. Miss A. Lughren has recently been acting as stenographer, owing to the increase of the work.

The outside staff comprises the tidal observers on both coasts, in addition to the officers and crew of the surveying steamer *Gulnare*. There are twelve observers on the eastern coasts of Canada and the Pacific coast, in charge of the principal tidal stations at which observations are carried on continuously, day and night, summer and winter. The salaries they receive are small, as the work occupies a short time in each day. During the past season, there were also fifteen temporary observers in charge of the secondary tidal stations in British Columbia, as well as one on the lower St. Lawrence.

Respectfully submitted,

WM. P. ANDERSON, M. INST. C.E.,  
*Chief Engineer.*

Chief Engineer's Office,  
Department of Marine and Fisheries,  
Ottawa, Canada, April 1, 1910.



(INCLOSURE A.)

DETAILED REPORT OF THE CHIEF ENGINEER OF THE DEPARTMENT OF MARINE AND FISHERIES ON CONSTRUCTION, ESTABLISHMENT AND IMPROVEMENT OF LIGHTHOUSES AND OTHER AIDS TO NAVIGATION, UP TO MARCH 31, 1910.

To the Deputy Minister,  
Department of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit a detailed report on work done in the construction and establishment of aids to navigation, for the twelve months ending March 31, 1910.

NOVA SCOTIA.

NEW AIDS TO NAVIGATION.

Light station.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Minudie... ..	Establishment of a 20-foot pole on the public wharf, hoisting a Chance anchor lens lantern.	Day's labour....	F. L. Fultz.....	125 50
Maitland. ....	" "	" .....	F. L. Fultz.....	97 78
Port Wade.....	Erection of a 23-foot wooden lighthouse tower, square in plan, with sloping sides, surmounted by a square wooden lantern.....	Contract.....	J. F. Morrison, jr., Thornes Cove, N. S.	375 00
Redman head ..	Erection of 22-foot wooden light house tower, square in plan, with sloping sides, surmounted by square wooden lantern....	" .....	Jas. Hemlow, jr., Liscomb, N. S....	525 00
L'Ardoise .....	Erection of two 22-foot wooden lighthouse towers, square in plan, with sloping sides, surmounted by square wooden lanterns.....	" .....	L. Mury, West Arichat, N.S.	1,340 00
Flint island....	(1) Provision of the machinery for a 3-inch duplicate diaphone plant, with 12-H. P. engines..	Furnished under general contract.....	Can. Fog Signal Co., Toronto, Ont....	8,100 00
	(2) Erection of a wooden fog alarm building.....	Day's labour....	N. J. Campbell .....	4,827 11
	(3) Installing machinery in the above .....	" .....	T. Phillips.....	
	(4) Erection of a 62-foot reinforced steel concrete light-house tower, hexagonal in plan with six flying buttresses, and surmounted by a circular metal lantern .....	" .....	F. Silver .....	
	(5) Frection of a wooden boat-house, oil store and outbuildings.....	" .....	F. Silver.....	
	(The above work was started in 1908-09: see Annual Report for that year.)			



NOVA SCOTIA—Continued.

NEW AIDS TO NAVIGATION—Continued.

Light station.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Freels, cape . . . .	(1) Provision of the machinery for a 3-inch duplicate diaphone plant, with 12-H. P. engines, less a circulating pump, and with other modifications in the standard specification. . . .	Furnished under general contract. . . . .	Can. Fog Signal Co., Toronto, Ont. . . . .	7,535 26
	(2) Pelton water wheel. . . . .	Contract. . . . .	W. Kennedy & Son, Owen Sound, Ont. . . .	500 00
	(3) Erection of a wooden fog alarm building, engineers dwelling house, and outbuildings. . . . . (This work is still under way and will be completed during the coming season of 1910-11.)	Day's labour. . . .	J. L. Colter . . . . .	4,783 28

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Apple River. . . .	Repairs to the lightkeeper's dwelling house and coal shed.	Day's labour. . . .	J. Leslie. . . . .	116 85
Parrsboro. . . . .	Repairs to the lighthouse tower and breakwater. . . . .	" . . . .	G. Osborne. . . . .	704 55
Peter island . . . .	Erection of a new 44-foot octagonal wooden lighthouse tower, surmounted by an octagonal iron lantern. . . . .	Contract. . . . .	W. Brooks, Digby, N.S.	1,350 00
Fourchu, cape (1)	Installing a new fog alarm boiler	" . . . . .	The New Birrell Johnson Iron Co., Yarmouth, N.S.	500 00
	(2) Repairs to the coal shed, &c . . .	Day's labour. . . .	Wm. Carroll. . . . .	296 36
Candlebox island	Breakwater repairs. . . . .	" . . . .	P. Amiro. . . . .	234 19
Big Fish island.	Lighthouse repairs. . . . .	" . . . .	F. L. Fultz. . . . .	150 49
Baccaro . . . . .	Repairs to the lighthouse tower.	" . . . .	J. A. Christie. . . . .	498 37
Roseway, cape. . .	" " . . . .	" . . . .	L. Nickerson. . . . .	223 94
Sand spit. . . . .	Repairs to the pier. . . . .	" . . . .	J. A. Christie. . . . .	242 05
Gull rock. . . . .	Repairs to the lighthouse tower; also building new boathouse and oil shed. . . . .	" . . . .	A. Giffin. . . . .	788 32
Cross island. . . .	Repairs to the lightstation. . . .	" . . . .	H. N. Pyke. . . . .	504 26
Hobson island. . .	Extending the breakwater 50 feet, and repairing the old portion. . . . .	" . . . .	H. A. Berringer . . . . .	579 39
Westhaver island	Addition to the lightkeeper's dwelling house. . . . .	" . . . .	W. Eisenhaur. . . . .	207 90
Green island . . .	Erecting a new boathouse and oil store. . . . .	" . . . .	S. Samson. . . . .	333 04
Sambro . . . . .	Erecting a new boathouse and slip. . . . .	" . . . .	I. J. Stephens. . . . .	501 47
Mauger beach. . .	Repairs to the breakwater. . . .	" . . . .	Wm. Icton . . . . .	877 29
Beaver island. . .	Installing new diaphone plant. . .	" . . . .	T. Phillips. . . . .	210 73
Wedge island. . .	Protection work repairs. . . . .	" . . . .	J. Mills. . . . .	277 61
Country harbour	Outbuilding repairs. . . . .	" . . . .	S. C. McMillan. . . . .	416 19
Petitdegrat. . . .	Cribwork repairs. . . . .	" . . . .	S. Samson. . . . .	268 41
Arichat. . . . .	Lantern repairs. . . . .	" . . . .	" . . . . .	143 09
Ronde, cap la. . .	Breakwater, repairs. . . . .	" . . . .	" . . . . .	1,672 69
St. Esprit. . . . .	Erecting new boathouse, and protection work repairs. . . . .	" . . . .	" . . . . .	719 03
Scatari. . . . .	Repairs to the lightstation. . . .	" . . . .	E. W. Peters. . . . .	834 05
Flat point. . . . .	Erection of buildings for fog alarm tests. . . . .	" . . . .	" . . . . .	530 20



NOVA SCOTIA—Continued.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS—Continued.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
McNeil beach...	Erection of a new 33-foot wooden lighthouse tower, square in plan, with sloping sides, surmounted by a square wooden lantern. (This tower replaces the old pole light formerly exhibited here)...	Contract..	L. Mury, West Arichat, N.S.....	780 00
St. George, cape North, cape.....	Lighthouse tower repairs..... Erection of a new reinforced steel concrete tower. (The old Cape Race tower was taken down in sections, and shipped to the site, where it is now being erected).....	Day's labour....	G. W. Wolfe.....	825 90
Pugwash. ....	Protection work repairs.....	" .....	" .....	1,476 78
St. Paul island..	Erection of a new wooden fog alarm building... ..	" .....	W. H. Browne.....	327 83
		" .....	J. L. Colter ... ..	2,610 30

NEW BRUNSWICK.

NEW AIDS TO NAVIGATION.

Macfarlane point	Erection of 27-foot wooden light-house tower, square in plan, with sloping sides, surmounted by a square wooden lantern..	Day's labour....	Ed. Rourke.....	761 56
Outhouse point..	Erection of 27-foot wooden light-house tower, square in plan, with sloping sides, surmounted by a square wooden lantern..	" .....	" .....	738 90
St. Louis gully..	Establishment of two 20-foot poles, hoisting Chance anchor lens lanterns. (These lights were removed from Black Lands gully, which station has been abandonned.).....	" .....	Jas. Legoof .....	52 82
Dalhousie.....	Erection of a 23-foot wooden lighthouse tower on the Government wharf. (This light replaces the range lights formerly exhibited on Douglas and Montgomery isds., which have been permanently discontinued). .....	" .....	P. B. Troy.....	654 02

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Musquash .....	Lighthouse tower repairs.....	Day's labour....	Ed. Rourke.....	280 98
Pecks point.....	Erection of a new wooden dwelling house for the fog alarm engineer ; also new coal shed.	Contract.....	E. R. Reid, Welchpool, N.B.....	1,940 00
Little Shippigan	Erection of a wooden shelter shed	Day's labour..	J. H. Blakley.....	245 80
Heron isd.....	" .....	" .....	Ed. Rourke.....	301 50



PRINCE EDWARD ISLAND.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Panmure isd....	Erection of a new wooden dwelling house for the fog alarm engineer.....	Contract.....	J. M. Clark, Summerside, P.E.I.....	1,900 00
Blockhouse point	Lighthouse tower repairs.....	Day's labour....	B. Huntley.....	919 13
Charlottetown ..	Erection of a new freight shed on the Marine Government wharf.....	" ....	Capt. J. Nicholson.....	911 55

QUEBEC.

NEW AIDS TO NAVIGATION.

St. Chas. de Caplan .....	Establishment of a 20-foot pole hoisting a Chance anchor lens lantern... ..	Contract.....	U. Dion, St. Chas. de Caplan, P.Q.....	115 00
New Richmond.	" "	" .....	" "	115 00
Bonaventure....	" "	" .....	P. Bourdage .....	115 00
Est, cap à l'.....	Erection of a 33-foot octagonal reinforced steel concrete lighthouse tower, surmounted by an octagonal iron lantern. (This work is still under way)	Day's labour....	H. de Haan.....	1,098 27
Dogs, cape.....	(1) Provision of the machinery for a 3-inch duplicate diaphone plant, with 6-H.P engines. ..	Furnished under general contract.....	Can. Fog Signal Co., Toronto, Ont.....	6,800 00
	(2) Installing the above machinery.....	Day's labour...	A. Ouimet.....	16,050 04
	(3) Erection of a wooden fog alarm building.....	" ....	H. de Haan.....	
	(4) Erection of a 53-foot reinforced steel concrete lighthouse tower, octagonal in plan, and surmounted by a circular metal lantern.....	" ....	V. Talbot .....	
	(5) Erection of a wooden dwelling house for the light-keeper (This work was started during the season 1908-09 and is still in progress).....	" ....	H. de Haan .....	
Watts point ....	Erection of a 30-foot steel skeleton tripod, to serve as a day beacon.....	" ....	L. Hudon.....	230 20

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Belle Isle (W. end).....	Erection of a new wooden fog alarm building ; and renewing air piping to same from the power house.....	" ....	A. Cantin ..	9,497 84
Belle Isle, N. E. End.....	Repairs to the lightstation....	" ....	L. Hudon.....	1,014 19



SESSIONAL PAPER No. 21

## QUEBEC—Continued.

## CHANGES AND IMPROVEMENTS IN EXISTING AIDS—Continued.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				cts.
Bauld, cape.....	Reinforcing the present cast iron lighthouse tower.....	Day's labour....	J. Blanchette.....	4,854 32
Norman, cape...	Reinforcing the present cast iron lighthouse tower .....	" .....	" .....	3,373 89
Amour point....	Repairs to oil store, etc.....	" .....	L. Hudon.....	141 45
Anguille, cap...	Laying water piping.....	" .....	P. J. Colton .....	225 11
Ray, cape.....	Strengthening the cast iron lighthouse tower; installing two new boilers, provided from stock; and repairing the lightkeeper's dwelling house..	" .....	R. L. Kelso.....	2,497 85
Entry island....	Moving the lantern from its present position to the apex of the lightkeeper's dwelling house; and also moving the oil store.....	" .....	F. Parent.....	274 34
Whale island. . .	Rebuilding the day beacon, carried away by storm last winter.	Day's labour....	L. Hudon.....	245 27
Cap Chap wharf	Establishment of two poles, on the village wharf, 14 and 20 feet high respectively, hoisting Chance anchor lens lanterns.....	" .....	O. Tremblay.....	2,222 87
Cap Chat.....	Erection of a new 33-foot steel reinforced concrete light-house tower, square in plan, with sloping sides, surmounted by a circular metal lantern...	" .....	" .....	" .....
Matane .....	Erection of a new wooden dwelling house for the lightkeeper, and repairing the oil shed..	" .....	A. Vézina.....	4,570 21
Lower Traverse Lightship.....	Installing a diaphone plant.....	" .....	A. Ouimet.....	633 37
Lower Traverse.	The purchase of the schooner <i>William Foley</i> , to be fitted up as a lightship for this station.	.....	H. T. LeBlanc, Quebec, P.Q. ....	4,350 00
Upper Traverse.	Repairs to the pier.....	Day's labour....	A. Perron.....	3,223 65
St. Pierre (Orleans island)...	(1) Provision of the material for a 3-section steel skeleton light-house tower for the back light of this range.....	Furnished under general contract.....	Goold, Shapley & Muir, Brantford, Ont. ....	502 80
	(2) Erection of the above light-house tower, and alterations to the old front lighthouse tower.....	Day's labour....	O. Tremblay.....	1,652 34
Ste. Famille....	Moving back the lighthouse to a new site.....	" .....	" .....	379 08



MONTREAL DISTRICT.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Batiscan.. . . . .	Riprap repairs to the front pier.	Day's labour....	A. Filion.....	233 35
Port St. Francis.	Repairs to the front range pier..	" .....	E. Tremblay.....	94 50
Lac, pte. du ....	Construction of a new concrete pier to carry the front range light. The pier is 70 feet square at the bottom, with battered sides.....	" ...	" .....	15,312 00
St. Peter, lake..	Erection of a 22-foot wooden lighthouse tower on the front pier at No. 2 curve. The building is rectangular in plan, having a square tower on the north end.....	" .....	" .....	5,434 91
Barques, île des .	Repairs to front pier.....	" .....	A. Tremblay.....	728 35
Moine, île du....	Reinforcing the front pier ...	" .....	P. Beauchemin.....	3,236 03
Chambly. ....	Rebuilding the stone wall of the basin.....	" .....	D. Peterkin.....	275 66
St. Jean (Riche-lieu river).....	Erection of a 23-foot wooden lighthouse tower on the boom pier, to take the place of the open lantern formerly exhibited.....	" .....	" .....	606 42
Lavaltrie.... ..	Repairing both concrete piers of this range.....	" ...	A. Tremblay.....	2,805 08
Contrecoeur vil-lage.....	Strengthening and repairing the front range concrete pier.....	" .....	" .....	6,374 34
Verchères Tra-verse.....	Repairing both piers of the range.	" .....	" .....	1,787 12
Ste. Thérèse, île.	Moving the front light, and repairs to the back lighthouse tower.....	" .....	P. Beauchemin.....	1,983 30

ONTARIO.

NEW AIDS TO NAVIGATION.

Supple point....	Erection of a 27-foot wooden lighthouse tower on a masonry foundation, surmounted by a square wooden lantern.....	Day's labour....	T. H. Brewer.....	829 91
Burlington beach	(1) Provision of the machinery for a 1-inch single diaphone plant, with a 3-h.p. gasoline engine.....	Furnished under general contract.....	Can. Fog Signal Co., Toronto, Ont.....	1,170 00
	(2) Installation of the above machinery.....	Day's labour....	W. H. Roebuck.....	218 65
Port Stanley....	Erection of a reinforced concrete gas lighted beacon, 27 feet high, on the outer end of the breakwater.....	Contract.....	F.R. Miller, Port Stanley, Ont.....	3,850 00
Penetanguishene	Erection and installation of two electric lights on poles.....	" .....	Penetanguishene Electric Company.....	143 00



SESSIONAL PAPER No. 21

ONTARIO—Continued.

NEW AIDS TO NAVIGATION—Continued.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year,
				\$ cts.
Sheguiandah....	Establishment of two poles, hoisting Chance anchor lens lanterns, to serve as a range, with a diamond-shaped slatted daymark attached to each....	Day's labour....	T. H. Brewer.....	79 77
Goderich.....	Erection of a reinforced concrete gas lighted beacon, 15 feet high, on the western end of the breakwater.....	Contract.....	Wm. Bermingham, Kingston, Ont.....	3,000 00
Belle river.....	Erection of two day beacons, consisting of diamond-shaped slatwork attached to poles....	Day's labour...	T. H. Brewer.....	118 46
Sand point.....	Erection of a 22-foot wooden lighthouse tower, square in plan, with sloping sides, surmounted by a square wooden lantern.....	" .....	M. J. Egan.....	287 67
Gimli (Lake-Winnipeg)....	Erection of a 23-foot wooden lighthouse tower, square in plan, with sloping sides, surmounted by a square wooden lantern.....	" .....	Superintended by W. S. Young, Inspector of Fisheries, Selkirk, Man.	661 33

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Arnprior.....	Lighthouse tower repairs.....	Day's labour....	T. H. Brewer.....	102 00
Spence island...	Erection of a 27-foot wooden lighthouse tower, on a masonry foundation; replacing the old pole light and shed, which has been removed.....	" .....	" .....	838 76
Pigeon island...	Constructing lantern platform for the new tower.....	" .....	M. J. Egan.....	257 96
Peter, point....	(1) Provision of the material for a 3-inch duplicated diaphone plant, with 12-h.p. engines...	Furnished under general contract.....	Can. Fog Signal Co., Toronto, Ont. ....	8,100 00
	(2) Installation of the above machinery .....	Day's labour....	W. H. Roebuck,.....	1,346 24
	(3) Alterations to the old fog alarm building, and repairs to the lighthouse tower.....	" .....	M J. Egan.....	
Scotch Bonnet..	Repairs to the concrete breakwater and lighthouse tower ..	Day's labour....	M. J. Egan .....	1,712 90
Presqu'ile .....	Protection work repairs.....	" .....	M. J. Egan .....	361 56
Edward, point..	Rebuilding the front range wooden lighthouse tower, destroyed by fire.....	" .....	T. H. Brewer.....	667 60
Great Duck isd..	Lighthouse tower repairs .....	" .....	M. J. Egan... ..	1,597 79
Nottawasaga isd	Repairs to the lightkeeper's dwelling house, boathouse and outbuildings, also to the protection work .....	" .....	M. J. Egan.. ..	1,034 71



ONTARIO—Continued.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS—Continued.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Burlington be'ch	Erection of a new 41-foot reinforced steel concrete lighthouse tower, octagonal in plan, surmounted by an octagonal iron lantern.....	Day's labour....	F. P. Jennings... ..	3,970 32
Port Dalhousie..	Repairs to the lightkeeper's dwelling house .....	" .....	B. McGrath.....	241 97
Colchester reef..	Protection work repairs... ..	" .....	M. J. Egan.....	6,478 71
Killarney .....	(1) Erection of a new 29-foot wooden lighthouse tower, surmounted by an octagonal iron lantern, at Killarney east. ..	" .....	T. H. Brewer .....	782 29
	(2) Erection of a new 29-foot wooden lighthouse tower, surmounted by an octagonal iron lantern, at Killarney west. ..			
Shoal island ....	Erection of a new wooden lightkeepers's dwelling house, with a square wooden lantern rising from the middle of its hip roof.....	" .....	D. Peterkin. ....	1,493 22
Sault Ste. Marie	(1) Provision of the material for a 77-foot steel skeleton lighthouse tower, for the back light of the canal lower entrance range. ....	Furnished under general contract.....	Goold, Shapley & Muir, Brantford, Ont....	814 20
	(2) Provision of the material for a 54-foot steel skeleton lighthouse tower, for the back light of the canal upper entrance range. ....	" .....	" .....	516 50
	(3) Provision of the material for a 20 foot steel skeleton lighthouse tower, for the front light of the canal upper entrance range.....	" .....	" .....	377 85
	(4) Erecting the above three lighthouse towers.....	Day's labour....	T. H. Brewer.....	2,998 24
Pins, pointe aux.	Lighthouse tower repairs .....	" .....	T. H. Brewer.....	278 20
Caribou island..	(1) Provision of the material for a 5-inch duplicate diaphone plant, with 12-H. P. engines..	Furnished under general contract.....	Can. Fog Signal Co., Toronto, Ont....	11,840 00
	(2) Erection of the above machinery.. ..	Day's labour....	W. H. Roebuck.....	3,675 64
	(3) Alterations to the old fog alarm building.....	" .....	D. Peteckin.....	
Rosseau .....	Cribwork repairs; also renewing the lighthouse tower foundations.....	" .....	M. J. Egan.....	409 58



SESSIONAL PAPER No. 21

BRITISH COLUMBIA.

NEW AIDS TO NAVIGATION.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Triangle island..	To expediate the hauling of materials for the construction of a reinforced concrete light-house tower, etc., as well as for the establishment of a wireless telegraph station, a roadway was blasted from the shore to the building sites, and an inclined tramway constructed. A large quantity of building materials were also purchased for construction work, which will be carried on during the coming fiscal year .....	Day's labour....	J. D. Macdonald.....	20,549 38
Estevan point...	Erection of a 100-foot reinforced steel concrete lighthouse tower, octagonal in plan, stiffened with 8 flying buttresses, and surmounted by a circular metal lantern .....	" .....	L. Humber.....	20,147 46
Carmanah.....	(1) Provision of the machinery for a 3-inch duplicate diaphone plant with two 12 h.p. engines.	Furnished under general contract.....	Canada Fog Signal Co ..	8,100 00
	(2) Installing the above machinery .. ..	Day's labour....	W. H. Peters .....	7,651 44
	(3) Erection of a new wooden fog alarm building. ....	" ..	L. Cullison.....	
	(4) Repairs to the lighthouse tower .....	" ...	" .....	
Bamfield islands	Erection of a concrete beacon (under construction) .....	" .....	H. C. Killeen.....	668 40
Lardo spit .. ...	Establishment of a pole, hoisting a Chance anchor lens lantern, with a shed erected at the base.....	" .....	Under the supervision of Capt. Gore, superintendent C. P. R. Lake and River Service.....	181 90

CHANGES AND IMPROVEMENTS IN EXISTING AIDS.

Green island....	Relining of the lighthouse tower, and other repairs.....	Day's labour....	C. N. Tubman.....	1,265 94
Lawyer island ..	Erection of a 66-foot octagonal wooden lighthouse tower, surmounted by a polygonal iron lantern .....	" .....	J. F. Redmond.....	7,108 66
Ivory island ....	Erection of a new shed and derrick; also repairs to the fog alarm building .....	" .....	C. N. Tubman.....	1,730 67
Race rocks.. ...	(1) Provision of the machinery for 3-inch duplicate diaphone plant, with 6-h.p. engines....	Furnished under general contract.....	Canada Fog Signal Co., Toronto, Ont .....	6,800 00



BRITISH COLUMBIA—Continued.

CHANGES AND IMPROVEMENTS IN EXISTING AIDS—Continued.

Lightstation.	Nature of the work.	How performed.	Contractor or foreman.	Expenditure during fiscal year.
				\$ cts.
Quatsino (Entrance island).	(2) Installing the above machinery .....	Day's labour....	W. H. Peter....	4,681 25
	(3) Erection of a new wooden fog alarm building .....	" .....	L. Cullison.....	
	Erection of a new wooden light-keeper's dwelling house, with an octagonal iron lantern rising from the middle of its hip roof.	" .....	H. C. Killeen.....	6,864 57
West coast trails (Vancouver island) .....	This work was continued during the season of 1909-10, and a first class trail is now in existence along the water front in the vicinity of Cape Beale and Pachena point, and beyond in the direction of Carmanah.	" .....	J. A. Macdonald .....	31,014 88

Respectfully submitted.

WM. P. ANDERSON, M. INST., C.E.,  
Chief Engineer.

Chief Engineer's Office,  
Department of Marine and Fisheries,  
Ottawa, Canada, April 1, 1910.



SESSIONAL PAPER No. 21

## APPENDIX No. 2.

## ANNUAL REPORT OF THE COMMISSIONER OF LIGHTS.

To the Deputy Minister of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the seventh annual report of this branch. The principal work performed has been the substitution of modern dioptric apparatus in a number of major coast lights, the improvement of minor coast lights by the installation of petroleum vapour as an illuminant, an extension of the gas buoy and beacon service throughout the various provinces, and the maintenance of lights and other aids to navigation throughout the Dominion, together with the installation of what new apparatus was required at new stations.

The gas buoys and beacons continue to give satisfaction, and during the winter just passed there were less gas buoys adrift or out of operation than in any previous winter, this being due to the fact that the department is adding to its information on this subject, thereby making possible a better selection of moorings and more expert handling. Only one loss occurred in the matter of gas buoys, viz., the No. 11 gas and whistling buoy, which broke adrift from the Southwest ledge, Cape Sable, and went ashore on Noddy island. Parts of the buoy were damaged, such as the superstructure and whistling tubes, but the buoy body will be recovered at the first opportunity.

The submarine bells have given excellent service, having been in constant operation during thick weather since their establishment some three years ago. Four shore stations are in operation: Negro Head, Yarmouth, Chebucto Head and Louisburg; and five lightship stations: Lurcher, Anticosti, White Island, Red Island and Prince Shoal.

In the Nova Scotia agency, the *Lady Laurier* and *Aberdeen* have been in use in connection with the lighthouse and buoy service. The buoys on the Bay of Fundy coast of Nova Scotia from Cape Sable inward are under the control of the New Brunswick agency.

In the New Brunswick agency, much improvement has been effected by reason of the C.G.S. *Stanley* having been detailed for buoy service in that agency, at the same time rendering unnecessary the employment of chartered vessels and greatly improving conditions with regard to the buoy service.

It has not yet been possible to provide a permanent base of operations, equipped with suitable facilities, for handling the work of this agency, but it is hoped that in the near future suitable arrangements can be made.

In the Prince Edward Island agency, the C.G.S. *Brant* is useful in delivering lighthouse supplies, but is not large enough to handle the larger buoys. These buoys are handled spring and fall by one of the steamers of the Nova Scotia agency.

In the Quebec agency, facilities for handling lighthouse supplies and buoys are satisfactory. The larger buoys in the Magdalene islands, which some years ago were maintained by contract and later by the Prince Edward Island agency, are again about to be maintained under contract system, a reasonable offer for maintaining them having been received by the department. This arrangement will greatly lessen the work in this branch with regard to this particular service.

In the Montreal agency, there has been a material extension of the gas buoy service, and the need has been felt for a better class of vessel than the *Shamrock* to



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cope with the work in connection with it. However, when the new steamer provided for in this year's estimates shall have been constructed, this agency will be well provided with facilities so far as the lighthouse and buoy service is concerned.

The Dominion Lighthouse Depot, Prescott, still continues to be an establishment of great usefulness. From the depot is administered the buoy service between Montreal and Kingston, and like wise the buoy service in the Bay of Quinté. The depot is also a distributing point for apparatus throughout the Dominion, likewise a manufacturing centre for lighthouse apparatus of a special nature. Photometric and other tests are performed from time to time in order to determine the usefulness of new apparatus or to establish a comparison between various types of apparatus. Much useful information has thereby been obtained not available elsewhere.

The work in the Parry Sound agency consists particularly in the maintenance of gas buoys and acetylene lights in the Georgian bay. This service, which had hitherto been handled by the aid of a derrick scow and chartered tug, is now performed by the C.G.S. *Simcoe*, which was built in England and was put into service in the early summer of last year. This steamer also is employed on inspection work and delivery of lighthouse supplies from Kingston to Fort William, and for the removal of lightkeepers from rock stations in Lake Superior late in the fall and placing them on their stations again in the spring. Hitherto both the work of delivering supplies and removing lightkeepers was of necessity performed by chartered vessels.

In the British Columbia agency, much development has taken place in the lighthouse and buoy service. The C.G.S. *Newington*, which was last summer put into service in this agency, has been of very material assistance in connection with a large derrick scow. The need has been felt for some time for a powerful lighthouse and buoy steamer, and it is gratifying to observe in the estimates an amount of money for the provision for such vessel. The need has also been felt for a base of operations in the northern waters of British Columbia, and arrangements are under way towards providing a buoy depot at Prince Rupert.

Please find herewith inclosures as follow:—

*Inclosure No. 1.*—Statement by provinces, showing new aids to navigation established throughout the Dominion, also improvements effected in existing aids, during the fiscal year 1909-10.

*Inclosure No. 2.*—Statement by provinces, showing the number of lightstations, lights, fog-alarms and warning buoys in service during the fiscal year 1909-10.

*Inclosure No. 3.*—Statement by divisions, showing the number of gas buoys in service throughout the Dominion during the fiscal year 1909-10.

*Inclosure No. 4.*—Statement giving complete list of stations at which gas buoys were in operation throughout the Dominion during the fiscal year 1909-10.

In conclusion, I desire to express and record my appreciation of the able assistance rendered by my staff, and the untiring application to duty exhibited by each member. It would not have been possible to carry out the large and increasing amount of work which is devolving upon this branch without the co-operation of all the officers connected with it.

I have the honour to be, sir,  
Your obedient servant,

J. G. MACPHAIL,  
*Acting Commissioner of Lights.*

Commissioner of Lights Office,  
Department of Marine and Fisheries,  
March 31, 1910.



## SESSIONAL PAPER No. 21

## (INCLOSURE No. 1.)

Statement by provinces, showing new aids to navigation established throughout the Dominion, also improvements effected in existing aids, during the fiscal year 1909-10.

## NOVA SCOTIA.

*New Aids.*

*L'Ardoise, Cape Breton Island.*—Range lights.

*Front Light.*—Apparatus is a dioptric 6th order  $270^{\circ}$  lens, with duplex lamp, showing a fixed red light.

Latitude, N.  $45^{\circ} 36' 50''$ .

Longitude, W.  $60^{\circ} 45' 0''$ .

*Back Light.*—Apparatus is a dioptric 6th order  $270^{\circ}$  lens, with duplex lamp, showing a fixed red light.

*Little Liscomb.*—Lighthouse established. The apparatus is a dioptric 5th order  $360^{\circ}$  lens, with duplex lamp, showing a fixed white light. The light should be visible 11 miles from all points of approach by water.

Latitude, N.  $45^{\circ} 0' 47''$ .

Longitude, W.  $61^{\circ} 57' 2''$ .

*Liverpool, Barrel Rock Bar.*—Electric light on dolphin, 660 feet N.  $66^{\circ}$  W. from light on Fort point.

Latitude, N.  $44^{\circ} 2' 37''$ .

Longitude, W.  $64^{\circ} 42' 29''$ .

*Liverpool, South Coast of Nova Scotia.*—Light established on middle of bridge in Liverpool harbour. The light is electric, fixed red, shown from a 32 candle-power lamp, and is elevated 28 feet above high-water mark, and should be visible one mile.

*Minudie, Cumberland Basin.*—Pole light, fixed white, on outer end of wharf. A  $270^{\circ}$  6th order lantern. Light should be visible six miles from all points of approach by water.

Latitude, N.  $45^{\circ} 46' 23''$ .

Longitude, W.  $64^{\circ} 20' 11''$ .

*Parker Cove, Bay of Fundy.*—Lighthouse established on the breakwater. The apparatus is a dioptric 6th order  $270^{\circ}$  lens with duplex lamp, showing a fixed red light. The light should be visible six miles from all points of approach by water.

Latitude, N.  $44^{\circ} 48' 46''$ .

Longitude, W.  $65^{\circ} 32' 17''$ .

*Port Wade, Annapolis Basin.*—Lighthouse established. The apparatus is a dioptric 6th order  $270^{\circ}$  lens, duplex lamp, showing a fixed red light. The light should be visible six miles from all points of approach by water.

Latitude, N.  $44^{\circ} 40' 22''$ .

Longitude, W.  $65^{\circ} 42' 40''$ .

*Improvements.*

*Arichat, Canso Harbour.*—A  $270^{\circ}$  5th order dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used.

*Canso Harbour.*—A 5th order  $360^{\circ}$  dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used.

*Cape Sable.*—A 55 m/m vapour installation replaces the constant level lamp heretofore in use.

*Cape St. Lawrence.*—A 55 m/m vapour light replaces the pressure lamp.



*Cranberry Island, Southeast Coast.*—The upper light shown from the lighthouse at this point has been changed from a fixed white light to an occulting white light with the following characteristic:—Visible 3 seconds, eclipsed 5 seconds, visible 17 seconds, eclipsed 5 seconds, in every 30 seconds. The illuminant is petroleum vapour burned under an incandescent mantle.

*Fishing Point, Pugwash Harbour, Northumberland Strait.*—The fixed white light at this point has been changed to an occulting white light visible for 6 seconds and eclipsed for 4 seconds alternately. The light should be visible 12 miles. The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour burned under an incandescent mantle.

*Flint Island, East Coast, Cape Breton Island.*—A new lighthouse has been built at this point, and a 3rd order dioptric quadruple flashing light has been installed, the light having the following characteristic:—

Flash..	.25	second.
Eclipse..	.75	“
Flash..	.25	“
Eclipse..	.75	“
Flash..	.25	“
Eclipse..	.75	“
Flash..	.25	“
Eclipse..	4.25	“

Complete revolution, 7½ seconds. The illuminant is petroleum vapour burned under an incandescent mantle. The light is elevated 74 feet above high-water mark, and should be visible 14 miles from all points of approach.

*Green Island, Country Harbour Approach.*—A group revolving white light, having two periods of maximum intensity, with an interval of 9 seconds between their points of greatest brilliancy followed by an interval of 27 seconds, during the greater part of which the light will be eclipsed, the apparatus completing a revolution, or phase, in 36 seconds, replaces the fixed white light heretofore shown. The illuminating apparatus is catoptric, and the illuminant, petroleum vapour, burned under an incandescent mantle. Candle-power, 40,000.

*Hobson Island.*—A duplex lamp replaces the constant level lamp heretofore used.

*Isaac Harbour, South Coast.*—The two fixed white lights, 20 feet apart vertically, shown from the lighthouse at this point, have been replaced by an occulting white light with the following characteristic:—

Visible..	25	seconds.
Eclipsed...	5	“
Visible..	5	“
Eclipsed...	5	“
		—
In every..	40	“

The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour, burned under an incandescent mantle. The lighthouse has been surmounted by a new octagonal iron lantern painted red.

*Kidston Island, St. Patrick Channel, Cape Breton Island.*—A 4th order 270° dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used.

*McNeil Beach, East Coast, Cape Breton Island.*—The pole light has been replaced by a tower, and the illuminating apparatus is a 6th order 270° lens. The light is fixed red, and should be visible five miles from all points of approach by water.



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*Parrsboro, Minas Basin, Bay of Fundy.*—The fixed white light has been improved by the substitution of a 4th order dioptric illuminating apparatus for the catoptric apparatus heretofore used.

*Point Prim, Digby Cut, Bay of Fundy.*—A revolving white catoptric light, the flashes attaining their greatest brilliancy every 15 seconds, replaces the fixed white light heretofore shown. The illuminant is petroleum vapour burned under an incandescent mantle.

*Pomquet Island, George Bay.*—A 5th order  $270^\circ$  dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used.

*Port George, Bay of Fundy.*—The fixed green light has been improved by the substitution of a 6th order dioptric illuminating apparatus for the catoptric apparatus heretofore used.

*Port Hood, East Coast, Cape Breton Island.*—The fixed light at this point has been changed to an occulting white light, visible 20 seconds and eclipsed 10 seconds alternately. The illuminating apparatus is dioptric of the 4th order. The red sector in this light has been discontinued.

*Ragged Island Harbour.*—The fixed white light heretofore shown from this station has been replaced by an occulting white light, visible 6 seconds and eclipsed 4 seconds alternately. The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour, burned under an incandescent mantle.

*Stoddart Island.*—A 5th order  $270^\circ$  dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used.

*Westport.*—Old lighthouse showing two fixed white catoptric lights has been replaced by new tower and a dioptric 5th order apparatus showing a fixed white light. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Gas Buoy Services.*

*Petitdegrat Inlet, Madame Island, Station No. 94.*—Automatic gas and bell buoy, painted in alternate black and white vertical stripes, with an occulting white light, has been established and moored in 10 fathoms of water.

One casualty only has to be reported, namely, the No. 11 gas and whistling buoy, anchored at the Southwest ledge, Cape Sable, broke adrift and went ashore on Noddy island. The body and whistling tubes were damaged, also the superstructure lost. The buoy will be brought to Halifax at the first opportunity and repaired.

*Other Aids to Navigation.*

*Cockerwit Passage, Southwest Coast.*—1. A steel conical buoy, painted red, has been established to mark the northern end of Bon Portage island, north bar.

2. A steel can buoy, painted black, has been established to mark the southern end of Robinson Ball, south bar.

3. A can buoy, painted black, has been established on the eastern side of Barret rock, which lies about one-third of a mile east of Stony island.

*East Ironbound Island, South Coast.*—Hand foghorn at light station.

*Kingsport, Minas Basin.*—Hand foghorn.

*L'Archeveque.*—Bell buoy.

*Laurier Rock, Lockport.*—The red conical buoy heretofore moored at this point has been replaced by a bell buoy, painted red.

*Minudie Point, Cumberland Basin, Bay of Fundy.*—A 5-foot steel conical buoy, painted red, has been established in four fathoms of water, two-fifths of a mile north-west of this point.

Latitude, N.  $45^\circ 47' 45''$ .

Longitude, W.  $63^\circ 23' 50''$ .



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*Ragged Reef Point, Chignecto Channel, Bay of Fundy.*—A bell buoy has been established one-half mile N. 56° W. from this point. The buoy is painted red, with name in white letters on the deck, and is moored in six fathoms of water.

Latitude, N. 45° 40' 30".  
Longitude, W. 64° 30' 20".

*Sheet Rock, South Coast.*—Hand foghorn at light station.

*Torbay, South Coast.*—Hand foghorn at light station.

*Wolf Point, Ship Harbour Approach.*—Hand foghorn at light station.

*Discontinuances.*

*Cranberry Island, Southeast Coast.*—Lower light (fixed white).

*Petitdegrat, Madame Island.*—Bell buoy.

NEW BRUNSWICK.

*New Lights.*

*Dalhousie Harbour, Restigouche River, Chaleur Bay.*—Lighthouse established. The light is occulting white, with the following characteristic:—

Visible.. . . . .	17 seconds.
Eclipsed.. . . . .	5 “
Visible.. . . . .	3 “
Eclipsed.. . . . .	5 “
<hr/>	
In every.. . . . .	30 “

The light is elevated 22 feet above high-water mark, and should be visible nine miles from all points of approach by water. The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour, burned under an incandescent mantle.

Latitude, N. 48° 4' 25".  
Longitude, W. 66° 22' 16".

*Macfarlane Point, Petitcodiac River.*—Lighthouse established. The light is a fixed white light, elevated 27 feet above high-water mark, and should be visible five miles from all points of approach by water. The illuminating apparatus is dioptric of the 7th order.

Latitude, N. 46° 0' 30".  
Longitude, W. 64° 41' 50".

*Outhouse Point, Petitcodiac River.*—Lighthouse established. The light is a fixed white light, elevated 27 feet above high-water mark, and should be visible five miles from all points of approach by water. The illuminating apparatus is dioptric of the 6th order.

Latitude, N. 46° 5' 4".  
Longitude, W. 64° 45' 35".

*St. Louis Gully.*—Front—7th order 180° anchor lantern, showing a fixed white light. Back—7th order 180° anchor lantern showing a fixed white light.

*Improvements.*

*Cape Spencer, Bay of Fundy.*—The alternating red and white light has been changed to a group revolving white light, having two periods of maximum intensity, with an interval of 9 seconds between their points of greatest brilliancy, followed by an interval of 27 seconds, during the greater part of which the light will be eclipsed,



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the apparatus completing a revolution, or phase, in 36 seconds. The illuminating apparatus is catoptric, and the illuminant, petroleum vapour, burned under an incandescent mantle. Candle-power, 40,000.

*Grey's Point.*—The pressed lens at this point has been replaced by a 240° 7th order improved anchor lantern.

*Hendry Farm, Washademoak Lake.*—A 6th order 240° dioptric illuminating apparatus replaces the catoptric apparatus heretofore used.

*Musquash Island, Washdemoak Lake.*—A 6th order 270° dioptric illuminating apparatus replaces the catoptric apparatus heretofore used.

*Newcastle, Miramichi River.*—This light has been improved by the substitution of a 6th order 270° dioptric illuminating apparatus for the pressed lens heretofore used.

*St. John Beacon Light.*—This light has been changed from a fixed red light to an occulting white light, visible 7 seconds and eclipsed 3 seconds alternately. The illuminant is petroleum vapour burned under an incandescent mantle.

*Discontinuances.*

*Black Lands Gully, Kouchibouguac Bay.*—Range lights.

*Cape Tormentine, Northumberland Strait.*—Fog bell.

*Dalhousie Harbour, Chaleur Bay.*—Light on railway shed. Light on Montgomery island.

*Other Aids to Navigation.*

*Petite Lameque Bay, Shippigan Sound.*—Two spar buoys have been established at this point. The more northerly buoy is painted black, and is moored in 2½ fathoms of water.

Latitude, N. 47° 48' 14".

Longitude, W. 64° 42' 6".

The more southerly buoy is painted red and is moored in three fathoms of water.

Latitude, N. 47° 48' 22".

Longitude, W. 64° 41' 5".

*Tormentine Reefs, Northumberland Strait.*—A steel can buoy, painted black, replaces bell buoy.

## PRINCE EDWARD ISLAND.

*Improvements.*

*Cape Bear, Southeast Coast.*—The revolving red catoptric light has been changed to a revolving white catoptric light, the flashes attaining their greatest brilliancy every 30 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle.

*East Point, Northeast Coast.*—The revolving catoptric light attaining its greatest brilliancy every three minutes has been changed to a revolving white catoptric light, attaining its greatest brilliancy every 15 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Haszard Point.*—Front—25 m/m vapour installation. Back—25 m/m vapour installation.

*North Point.*—The revolving white catoptric light attaining its greatest brilliancy every minute has been changed to a revolving white catoptric light, attaining its greatest brilliancy every 30 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Wood Island.*—35 m/m vapour installation.



Other Aids to Navigation.

*Belle River, Northumberland Strait.*—A steel can buoy has been established southward from Belle river breakwater, south coast of Prince Edward Island. From the buoy, Belle point bears S. 56° E. and Nicholas point bears N. 22½° W. The buoy is in the alignment of Woods island lighthouse and Belle point. It is moored in 2½ fathoms of water, and is painted black, with the name in white letters on top.

Latitude, N. 45° 58' 12".

Longitude, W. 62° 50' 20".

*Tryon Shoal, Northumberland Strait.*—The whistling buoy which heretofore marked this point has been replaced by a steel conical buoy, pointed red, with name in white letters.

Gas Buoy Services.

*Midstraits between Tryon shoal and Tormentine reefs.*—A combined gas and whistling buoy has been established.

Latitude, N. 46° 9' 25".

Longitude, W. 63° 38' 30".

From the buoy, Carleton head bears N. 5° W., distant 6¼ miles, Indian point bears S. 82° W., distant 6¼ miles, and Jourimain island lighthouse bears N. 66° W., distant 7 miles. The buoy is moored in 12 fathoms of water. It is of steel, cylindrical, quartered black and white, with the words 'Midchannel, Northumberland strait,' painted on it. The buoy shows an occulting white light.

*Miscouche Shoal, Bedeque Bay.*—The gas and whistling buoy heretofore moored at the southeastern end of this shoal has been moored further southward, and is now in five fathoms of water.

Latitude, N. 46° 20' 19".

Longitude, W. 63° 52' 0".

From the buoy, Sea Cow head lighthouse bears S. 42° E., and Indian point lighthouse bears N. 62° E.

QUEBEC.

New Aids.

*Cape Dogs, River St. Lawrence.*—A 3rd order dioptric double flashing light and lantern has been erected on a new tower. The light is flashing white, having the following characteristic:—

Flash.. . . . .	.25 seconds.
Eclipse.. . . . .	.75 "
Flash.. . . . .	.25 "
Eclipse.. . . . .	3.75 "

The illuminant is petroleum vapour, burned under an incandescent mantle. Candle-power, 100,000.

Latitude, N. 47° 54' 34".

Longitude, W. 69° 48' 17".

*Chat Wharf, River St. Lawrence.*—Front—240° anchor lantern on pole 218 feet from outer end of wharf. Light is fixed red. Back—240° anchor lantern on pole 310 feet west from front light.

*Lower Traverse Pier, River St. Lawrence.*—Lightship to replace pier which was carried away by ice.

*St. Charles de Caplan.*—360° 7th order anchor lantern.



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*Improvements.*

*Bagot Bluff, Anticosti Island.*—A new catoptric illuminating apparatus has been installed. The light, which is revolving white catoptric, attains its greatest brilliancy every 20 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Biquette.*—A 3rd order dioptric single flashing light, showing one bright flash every three seconds, thus:—

Flash.. . . . .	.20 seconds,
Eclipse.. . . . .	2.80 “

replaces the revolving white catoptric light. The illuminant is petroleum vapour, burned under an incandescent mantle. Candle-power, 100,000.

*Cape Chat, River St. Lawrence.*—A new lighthouse tower having been erected, the revolving white catoptric light has been discontinued, and a new 3rd order dioptric light and lantern installed. The light is flashing white, showing one bright flash every three seconds, thus:—

Flash.. . . . .	.20 seconds.
Eclipse.. . . . .	2.80 “

The illuminant is petroleum vapour, burned under an incandescent mantle. The light is elevated 120 feet above high-water mark, and should be visible 17 miles from all points of approach by water. Candle-power, 100,000.

*Father Point.*—A 3rd order dioptric quadruple flashing light, showing a group of four bright flashes every  $7\frac{1}{2}$  seconds, thus:—

Flash.. . . . .	.25 seconds,
Eclipse.. . . . .	.75 “
Flash.. . . . .	.25 “
Eclipse.. . . . .	.75 “
Flash.. . . . .	.25 “
Eclipse.. . . . .	.75 “
Flash.. . . . .	.25 “
Eclipse.. . . . .	4.25 “

has been installed. The illuminant is petroleum vapour, burned under an incandescent mantle. Candle-power, 55,000.

*Flower Island, Strait of Belle Isle, Newfoundland.*—The revolving white catoptric light, attaining its greatest brilliancy every 30 seconds, has been changed to a revolving white catoptric light, attaining its greatest brilliancy every 12 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle. Candle-power, 30,000.

*Port Basque, Southwest Coast, Newfoundland.*—The fixed red light at this point has been changed to an occulting white light with the following characteristic:—

Visible.. . . . .	5 seconds.
Eclipsed.. . . . .	5 “
Visible.. . . . .	15 “
Eclipsed.. . . . .	5 “

In every.. . . . . 30 “

The illuminating apparatus is dioptric of the 4th order, and the illuminant petroleum vapour, burned an incandescent mantle.

*Rivière du Loup, River St. Lawrence.*—The light shown from this lighthouse on the south shore has been changed from a fixed white to a fixed red light, which should be visible seven miles from all points of approach by water.



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*Ste. Croix, River St. Lawrence.*—The fixed white light at this point has been improved by the substitution of a 4th order dioptric illuminating apparatus for the catoptric apparatus heretofore used. The illuminant is petroleum vapour, burned under an incandescent mantle.

Latitude, N.  $46^{\circ} 37' 44''$ .

Longitude, W.  $71^{\circ} 43' 53''$ .

*St. Jean, Island of Orleans.*—The light on the wharf at this point has been moved to the new freight shed on the outer end of the wharf. The light is fixed white, and is shown from a square wooden lantern on the roof of the shed. The light is elevated 34 feet above high-water mark, and should be visible 11 miles from all points of approach by water.

*St. Jean, Richelieu River.*—A lighthouse tower has been erected at this point and a  $240^{\circ}$  7th order dioptric light installed, which replaces the lens lantern heretofore maintained. The light is fixed red, elevated 26 feet above the summer level of the river, and should be visible three miles in the line of range.

Latitude, N.  $46^{\circ} 17' 55''$ .

Longitude, W.  $73^{\circ} 13' 8''$ .

#### Other Aids.

*Anse aux Gascons, Chaleur Bay.*—Hand foghorn.

*Barachois de Malbaie, Gaspé Coast.*—Hand foghorn.

*Etang du Nord, Grindstone Island, Magdalen Islands.*—Hand foghorn.

*Goose Cape, River St. Lawrence.*—Hand foghorn.

*Hare Island.*—Steel conical buoy, painted red, No. 46—B.

Latitude, N.  $47^{\circ} 47' 40''$ .

Longitude, W.  $69^{\circ} 43' 20''$ .

*Ile du Milieu, River St. Lawrence.*—Range day beacons established to mark the axis of the dredged channel at the lower end of Ile aux Foins from the main channel to Ile du Milieu.

Front beacon—Latitude N.  $46^{\circ} 3' 2''$ ; longitude, W.  $73^{\circ} 10' 23''$ .

Back beacon stands 500 feet N.  $62^{\circ} 12' W.$  from the front one.

*Maranda Rocks, Island of Orleans, West End.*—The red spar buoy, No. 88—B, heretofore moored off the southern side of these rocks has been replaced by a steel conical buoy, painted red, moored in the same position.

*Pointe-au-Pavillon, Orleans Channel.*—A steel can buoy, painted black, has been established in three fathoms of water off this point.

Latitude, N.  $46^{\circ} 53' 31''$ .

Longitude, W.  $71^{\circ} 7' 6''$ .

From the buoy Ange Gardien front range light bears N.  $6^{\circ} W.$ , and Ange Gardien church bears N.  $48^{\circ} E.$

*St. Michel, River St. Lawrence.*—Two spar buoys, one painted black and the other red, have been moored at the outer end of the dredged channel leading to the wharf.

Latitude, N.  $46^{\circ} 53' 3''$ .

Longitude, W.  $70^{\circ} 54' 52''$ .

Two spar buoys, one painted black and the other red, have been moored 1,000 feet from the outer end of the wharf, one on each side of the dredged channel.

Latitude, N.  $46^{\circ} 53' 0''$ .

Longitude, W.  $70^{\circ} 54' 48''$ .

*Watts Point, Strait of Belle Isle.*—A day beacon has been erected between Cape Norman and Flower ledge lighthouse, Newfoundland. It is a skeleton steel tripod, 30 feet high, painted white.

Latitude, N.  $51^{\circ} 27' 22''$ .

Longitude, W.  $56^{\circ} 19' 27''$ .



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*Whale Island, Bonne Espérance Harbour, Gulf of St. Lawrence.*—The beacon erected in 1897 has been carried away, and replaced by a skeleton steel tripod, 30 feet high, painted white.

Latitude, N.  $51^{\circ} 21' 22''$ .

Longitude, W.  $57^{\circ} 40' 49''$ .

*Gas Buoys.*

*No. 44—Q, Cap Santé, River St. Lawrence.*—Gas buoy replaces red iron conical buoy.

*No. 59—B, Lower Traverse, River St. Lawrence.*—Gas buoy.

*Discontinuances.*

*Belle Isle, South End.*—Cotton powder bombs discontinued.

*Cap Santé, River St. Lawrence.*—Iron conical buoy painted red.

*Chambly Wharf, Richelieu River.*—The light on the wharf on the south side of Chambly basin, on the east side of the entrance to the canal.

*Father Point, River St. Lawrence.*—Cotton powder bombs discontinued.

*Lark Islet, Saguenay River Entrance.*—Light discontinued.

## QUEBEC—MONTREAL AGENCY.

*Other Aids to Navigation.*

*Batiscan Traverse.*—The black spar buoy No. 109—Q has been replaced by a steel can buoy, painted black.

*Cap Levrard.*—Black spar buoy No. 107—Q.

Latitude, N.  $46^{\circ} 32' 11''$ .

Longitude, W.  $72^{\circ} 10' 22''$ .

*Cap Madeleine.*—Black spar buoy No. 45—C has been replaced by a steel can buoy, painted black.

Black spar buoy No. 51—C has been replaced by a steel can buoy, painted black.

*Ile à l'Aigle.*—Black spar buoy No. 141—M has been replaced by a steel can buoy, painted black.

*Lake St. Peter, Curve No. 3.*—A black spar buoy, No. 15—L, has been established at the lower end of curve.

Latitude, N.  $46^{\circ} 15' 54''$ .

Longitude, W.  $72^{\circ} 41' 6''$ .

The black spar buoy (old No. 19—L) which was moored about three-fifths of a mile below Pointe du Lac front range light, has been withdrawn.

Latitude, N.  $46^{\circ} 15' 55''$ .

Longitude, W.  $72^{\circ} 41' 14''$ .

A black spar buoy, No. 19—L, has been moored at the old position of gas buoy No. 21—L, about one-quarter of a mile below Pointe du Lac front range light.

Latitude, N.  $46^{\circ} 15' 54''$ .

Longitude, W.  $72^{\circ} 41' 44''$ .

Black spar buoy No. 23—L has been moved 700 feet S.  $78^{\circ}$  W. from its old position.

Latitude, N.  $46^{\circ} 15' 46''$ .

Longitude, W.  $72^{\circ} 42' 21''$ .



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*Lake St. Louis.*—Spar buoy, known as 72—S, painted red and black, horizontal bands.

Latitude, N.  $45^{\circ} 25' 14''$ .

Longitude, W.  $73^{\circ} 44' 3''$ .

Spar buoy known as 74—S, painted red.

*Three Rivers.*—Red spar buoy No. 54—C has been replaced by a conical buoy, painted red.

Red spar buoy No. 56—C has been replaced by a conical buoy, painted red.

*New Aids.*

*Grenville Bay.*—Front—Pressed lens lantern. Back—Pressed lens lantern.

*Other Aids to Navigation—Gas Buoys.*

*Lake St. Peter.*—The following changes in buoyage have been made:—

*Poulier Laforce.*—Old number, 6—L. New number, 3—L.

English Bank.—Old number, 13—L. New number, 9—L.

Nicolet Traverse.—Old number, 17—L. New number, 13—L.

No. 21—L.—The gas buoy at this point has been moved 1,450 feet N.  $87^{\circ}$  from its old position.

Latitude, N.  $46^{\circ} 15' 51''$ .

Longitude, W.  $72^{\circ} 42' 3''$ .

*Lake St. Peter, Curve No. 3.*—A gas buoy, painted black, No. 17—L, has been established about one-half mile below Pointe du Lac front range light.

Latitude, N.  $46^{\circ} 15' 55''$ .

Longitude, W.  $72^{\circ} 41' 25''$ .

The acetylene gas light shown is a white light, automatically occulted at short intervals.

*Portneuf, No. 52—Q.*—The red spar buoy has been replaced by a gas buoy, painted red. The light is occulting white.

ONTARIO.

*New Aids.*

*Gimli, Man.*—5th order  $360^{\circ}$  lens with duplex lamp.

*Penetanguishene.*—Front—A group of two 50 candle-power electric lamps, showing a fixed white light. Back—A group of two 50 candle-power electric lamps, showing a fixed white light.

*Port Burwell.*—Two range lights in the northern part and on the east side of the harbour established by the Pennsylvania-Ontario Transportation Company, have been taken over by the department. The lights are fixed white, shown from reflector lanterns.

*Salt Point, entrance to Presqu'île Bay, Lake Ontario.*—7th order lens.

*Sand Point, Chats Lake, Ottawa River.*—8-inch pressed lens with duplex lamp.

*Supple Point, Allumette Island.*— $270^{\circ}$  6th order lens and duplex lamp.

*Improvements.*

*Burlington Bay, Lake Ontario.*—The range lights on masts have been discontinued, and a new tower built. The apparatus is a dioptric 4th order  $360^{\circ}$  lens, showing a fixed red light. Duplex lamp.

*Ditchburn Shoal, Rosseau Lake.*—The pressed lens formerly used has been replaced by a 7th order lens. The new iron lantern is square, and is painted red.



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*Cape Croker.*—A 3rd order double flashing light, having the following characteristic, has been erected:—

Flash.. . . . .	.25 seconds.
Eclipse.. . . . .	.75 “
Flash.. . . . .	.25 “
Eclipse.. . . . .	3.75 “

The illuminant is petroleum vapour, burned under an incandescent mantle. Candle-power, 100,000.

*Collingwood, Georgian Bay.*—The fixed red light shown from the front lighthouse has been improved by the substitution, in the alignment of the outer range of lights, of a 4th order lens for the 6th order lens heretofore used. In the alignment of the range to the wharfs a 7th order lens is now used.

*Kincardine.*—4th order lens and vapour installation replaces old catoptric light.

*Ninemile Point, Simcoe Island.*—The fixed white light has been changed to an occulting white light, visible six seconds and eclipsed four seconds alternately. The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour, burned under an incandescent mantle. Candle-power, 1,800.

*Pigeon Island.*—The revolving white catoptric light has been changed to a flashing white, showing two bright flashes every five seconds, thus:—

Flash.. . . . .	.22 seconds.
Eclipse.. . . . .	.78 “
Flash.. . . . .	.22 “
Eclipse.. . . . .	3.78 “

The illuminating apparatus is dioptric of the 4th order, and the illuminant, petroleum vapour, burned under an incandescent mantle. Candle-power, 25,000.

*Port Burwell.*—A 4th order 180° dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Port Colborne, Lake Erie.*—The light at the back range has been changed from occulting red to occulting white.

*Port Maitland.*—A 4th order 180° dioptric illuminating apparatus has been substituted for the catoptric apparatus heretofore used. The illuminant is petroleum vapour, burned under an incandescent mantle.

*Spence Island, Lower Allumette Lake.*—A fixed white light of the 7th order dioptric in a tower replaces the light shown from a lamp on a pole.

*Thunder Cape.*—Lens and vapour installation replaces old catoptric light.

*Western Islands, Georgian Bay.*—The occulting white light has been replaced by a 4th order dioptric single flashing light, giving one bright flash every 15 seconds. The illuminant is petroleum vapour, burned under an incandescent mantle.

#### Other Aids.

*Belle River, Lake St. Clair.*—Range day beacons. The front beacon is in:

Latitude, N. 42° 17' 51".

Longitude, W. 82° 42' 30".

The back beacon stands 375 feet S. 3° E. from the front.

*Cove Island, Lake Huron.*—Automatic whistling buoy in 23 fathoms of water, six miles N. 80° W. from Cove island lighthouse on Gig point.

Latitude, N. 45° 20' 8".

Longitude, W. 81° 52' 24".

The buoy is painted black and white in vertical stripes.



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*Devil Island, Lake Huron.*—Day beacons. Front beacon is in:

Latitude, N.  $45^{\circ} 16' 33''$ .

Longitude, W.  $81^{\circ} 43' 45''$ .

Back beacon on Willisroft island is N.  $20^{\circ}$  E., one-half mile from White rock.

*Four Mile Point, Simcoe Island, Lake Ontario.*—Hand foghorn.

*Goderich, Lake Huron.*—Black spar buoy about due south of the south end of the outer breakwater.

*Iroquois to Prescott.*—Red spar buoy, No. 138—U, established on the north side of the ship channel, 588 feet S.  $69^{\circ}$  W. from new position of 136—U.

Red spar buoy No. 138—U has been renumbered 140—U. It remains in its old position, 1,120 feet S.  $69^{\circ}$  W. from the new position of No. 136—U.

Black spar buoy No. 141—U, on the south side of the channel, has been moved 55 feet east from its old position to a point 1,215 feet N.  $35^{\circ}$  E. from the south pier head at the lower entrance to North channel.

Gas buoy No. 136—U and spar buoy 138—U have been exchanged in place and number. The spar buoy now 136—U is located 700 feet N.  $49^{\circ}$  W. from the south pier head at the western entrance to Galops canal.

#### *Other Aids.*

*Otter Island, Lake Superior.*—Hand foghorn.

*Port Burwell, Lake Erie.*—Platform bell buoy.

Latitude, N.  $42^{\circ} 38' 11''$ .

Longitude, W.  $80^{\circ} 48' 30''$ .

A fog bell has been established on the outer end of the east breakwater.

*Port Maitland, Lake Erie.*—Hand foghorn.

*Wingfield Basin, Georgian Bay.*—A red spar buoy has been moored in 17 feet of water on the west edge of the outer end of dredged cut, 600 feet outside of the point.

A black spar buoy has been moored in 17 feet of water on the east side on the inner end of the dredged cut, 400 feet inside the point.

A pair of tapering wooden beacons about 10 feet high by about 2 feet wide, painted white, are established on the south shore of the basin, which in one, bearing S.  $1^{\circ}$  W., mark a line 25 feet westward of the axis of the dredged cut.

#### *Gas Buoy and Beacon Services.*

##### *Montreal-Kingston Division—*

*Iroquois Canal.*—Gas buoy No. 136—U has been moved 175 feet N.  $53^{\circ}$  E. from its old position. No. 138—U.

*Penitentiary Shoal, Kingston Harbour Approach.*—Gas buoy, No. 61—T.

*Port Stanley, Lake Erie.*—Automatic acetylene gas beacon on breakwater, showing a fixed red light.

##### *Georgian Bay Division—*

*Bigsby, Key Inlet.*—Gas buoy, 20—K.

*Entrance, Key Inlet.*—Gas buoy, No. 2—K.

*Goderich, Lake Huron.*—Automatic acetylene gas beacon on the western end of breakwater off the entrance to the harbour.

*Inside, Key Inlet.*—Gas buoy, No. 26—K.

*Keefer Bend, Key Inlet.*—Gas buoy, No. 14—K.

*Kennedy Bank, Georgian Bay.*—Gas buoy, No. 10—P.

Latitude, N.  $45^{\circ} 30' 16''$ .

Longitude, W.  $80^{\circ} 40' 50''$ .



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*Maganatawan Ledges, Byng Inlet Approach.*—Gas buoy, No. 1—B.

Latitude, N.  $45^{\circ} 43' 49''$ .

Longitude, W.  $80^{\circ} 45' 27''$ .

*Mann Reef, Key Inlet.*—Gas buoy, No. 24—K.

*Murray Bend, Key Inlet.*—Gas buoy, No. 8—K.

*Vails Point, Georgian Bay.*—The red spar buoy which heretofore marked this shoal has been replaced by a combined gas and bell buoy, No. 1—P, moored in 10 fathoms of water,  $1\frac{1}{2}$  miles N.  $45^{\circ}$  W. from the point.

Latitude, N.  $44^{\circ} 44' 16''$ .

Longitude, W.  $80^{\circ} 46' 22''$ .

The buoy is of steel, cylindrical, painted black, surmounted by a steel frame supporting the bell and lantern; the light is fixed white. The illuminant is acetylene, generated automatically. The bell is rung by the motion of the waves.

#### *Gas Buoy Services.*

*Sault Ste. Marie Division.*—

*Vidal Shoal, St. Mary River.*—Gas buoy No. 2, at the upper end of Vidal shoal, on the southern edge of the dredged channel opposite the present red gas buoy.

*Vidal Shoal, St. Mary River.*—Gas buoy No. 3, on the northern edge of the channel at the lower end of Vidal shoal, 2,400 feet below the present red gas buoy at the upper end of Vidal shoal.

*Sault Ste. Marie Canal, Upper Entrance.*—Gas buoy No. 5, on the northern edge of the channel, 1,000 feet below Sault Ste. Marie canal upper entrance front range light, River St. Mary.

#### *Discontinuances.*

*Colquhoun Island, River St. Lawrence.*—Gas buoy No. 88—F.

*Goderich.*—Gas buoy moored south of western end of breakwater off the entrance to Goderich harbour, Lake Huron, has been discontinued.

*Lachine.*—Gas buoy No. 16—S.

*Kitchener Island, Lake Huron.*—Light.

*Pelee Island, Lake Erie.*—Light.

*Presqu'île, Georgian Bay.*—Light.

*Tolsmaville, Cockburn Island, Lake Huron.*—Light.

*Weller Bay, Lake Ontario.*—Light.

#### BRITISH COLUMBIA.

##### *New Lights.*

*Estevan Point, Vancouver Island, West Coast.*—Lighthouse established. The light is flashing white, showing a group of three flashes every 10 seconds, thus:—

Flash.. . . .	.30 seconds.
Eclipse.. . . .	1.37 “
Flash.. . . .	.30 “
Eclipse.. . . .	1.37 “
Flash.. . . .	.30 “
Eclipse.. . . .	6.36 “

The light is elevated 125 feet above high-water mark, and should be visible 17 miles from all points of approach by water. The illuminating apparatus is dioptric of the first order.

Latitude, N.  $49^{\circ} 22' 5''$ .

Longitude, W.  $126^{\circ} 32' 22''$ .

*Kootenay Landing.*—Pressed lens lantern.



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*Improvements.*

*Brockton Point, Vancouver Harbour.*—The 7th order light at this point has been improved by the substitution of a 4th order 270° lens.

*Entrance Island, Quatsino Sound.*—The thirty-one day Wigham lamp has been discontinued, and replaced by a dioptric 5th order fixed white light, shown from a new lighthouse.

*Other Aids to Navigation.*

*Boat Harbour, Stuart Channel.*—Steel conical buoy, painted red; will be known as the Entrance Point buoy.

Latitude, N. 49° 5' 40".

Longitude, W. 123° 47' 41".

*Canoe Pass, Roberts Bank, Strait of Georgia.*—A steel can buoy, surrounded by a latticework drum, the whole painted black, has been established.

Latitude, N. 49° 2' 3".

Longitude, W. 123° 15' 5".

*Danger Rock.*—A wooden spar buoy, painted red.

Latitude, N. 49° 5' 29".

Longitude, W. 123° 47' 51".

*Ellinor Rock, Prince Rupert Harbour Approach.*—Steel can buoy, painted red and black in horizontal bands.

*Grassy Point, Bayne Sound.*—Owing to a storm having destroyed the beacon at this point, a steel can buoy, painted black, has been moored in 12 fathoms of water.

Latitude, N. 49° 38' 53".

Longitude, W. 124° 54' 32".

*Helen Point.*—The explosive fog bell maintained at this point has been replaced by a fog bell operated by machinery.

*Kestrel Rock, Prince Rupert Harbour Approach.*—Spar buoy, painted black.

*Kitson Bank, Prince Rupert Harbour.*—(1) Steel conical buoy painted red, on northwest shoulder of bank.

Latitude, N. 54° 11' 22".

Longitude, W. 130° 20' 28".

(2) Steel conical buoy, painted red, on southwest shoulder of bank.

Latitude, N. 54° 9' 50".

Longitude, W. 130° 19' 19".

*Ladysmith, Oyster Harbour, Stuart Channel.*—Wooden platform buoy, 8 feet square, with slatwork pyramid surmounted by a drum, the whole painted black, has been established, to mark the edge of the shoal ground extending from the south shore of Oyster harbour.

Latitude, N. 48° 59' 40".

Longitude, W. 123° 48' 39".

The buoy is moored in three fathoms of water.

*Metlakatla Harbour.*—The shrub beacon having been destroyed by the sea, it has been replaced by a red conical buoy.

*Petrel Rock, Prince Rupert Harbour Approach.*—Steel can buoy, painted black.

*Porpoise Harbour, Chatham Sound.*—(1) Black spar buoy off northwest end of three-fathom bank on north side of entrance.

Latitude, N. 54° 12' 0".

Longitude, W. 130° 20' 2".

(2) Black spar buoy off the south end of three-fathom bank, on north side of entrance.

Latitude, N. 54° 11' 42".

Longitude, W. 130° 19' 45".



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(3) Black spar buoy in nine fathoms of water close southward of rock (drying nine feet) on north side of entrance.

Latitude, N.  $54^{\circ} 11' 48''$ .

Longitude, W.  $130^{\circ} 19' 3''$ .

*Gas Buoy Services.*

Station No. 36.—*Grey Point, Burrard Inlet, Strait of Georgia.*—Gas and bell buoy, replacing bell buoy.

Station No. 44.—*Goose Spit.*—Acetylene beacon.

Station No. 47.—*Oyster Bay.*—Gas and bell buoy.

Station No. 88.—*Kennedy Island, Skeena River, Chatham Sound.*—Gas beacon.

Latitude, N.  $54^{\circ} 5' 0''$ .

Longitude, W.  $130^{\circ} 10' 50''$ .

Station No. 93.—*Georgia Rock, Prince Rupert Harbour Approach.*—Gas and bell buoy.

Latitude, N.  $54^{\circ} 13' 7''$ .

Longitude,  $130^{\circ} 21' 42''$ .

Station No. 107.—*Banks Island, Browning Entrance, Hecate Strait.*—Gas and whistling buoy. Occulting white light.

Station No. 112.—*Copper Island, Skincuttle Inlet, Hecate Strait.*—Gas beacon, showing occulting white light.

Latitude, N.  $52^{\circ} 19' 48''$ .

Longitude, W.  $131^{\circ} 10' 0''$ .

*Discontinuances.*

*Kestrel Rock, Prince Rupert Harbour Approach.*—Gas buoy.

*Chatham Point, Discovery Passage.*—Explosive fog bell.

*New England Rock.*—Gas and whistling buoy.

*Ridley Island Range.*—Day beacons.

*Stenhouse Shoal, Brown Passage.*—Gas and whistling buoy.

*Swiftsure Bank, Juan de Fuca Strait.*—Gas and whistling and bell buoy.

## (INCLOSURE No. 2.)

Statement by provinces, showing the number of lightstations, lights, fog-alarms and warning buoys in service during the fiscal year 1909-10.

Number of lightstations, lights, fog-alarms and warning buoys in the Dominion:—

	Lightstations.	Fog alarm stations.	Lights.	Lightships.	Lightboats.	Keepers.	Diaphones.	Sirens.	Fog horns and trumpets.	Fog bells.	Hand fog horns.	Hand fog bells.	Gas buoys.	Gas beacons.	Whistling buoys.	Bell buoys.	Submarine bells.	Fog whistles.	Fog guns or bombs.
Nova Scotia.....	247	2	277	2	..	270	10	..	3	5	43	..	30	....	13	37	3	7	1
New Brunswick .....	117	4	146	1	1	124	8	..	6	3	20	1	23	....	4	7	2	2	..
Prince Edward Island..	45	..	72	..	..	49	1	..	1	..	2	..	6	....	1	..	..	..	..
Quebec.....	138	1	168	5	1	146	18	1	2	..	15	2	33	....	2	2	4	3	6
Montreal.....	102	..	172	3	..	122	..	..	..	..	..	..	66	....	..	..	..	..	..
Ontario.....	223	..	289	..	..	184	22	2	1	3	38	1	79	2	1	4	..	2	..
Manitoba.....	8	..	11	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..
British Columbia.....	89	2	92	1	..	60	13	..	4	3	3	..	17	30	3	..	..	..	..
	969	9	1,227	12	2	961	72	3	17	20	121	4	254	32	24	50	9	14	7



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Besides the above-mentioned lights, there are in the Dominion lights under private control, as follows:—

Nova Scotia.....	1
New Brunswick.....	1
Quebec.....	2
Montreal.....	7
Ontario.....	31
British Columbia.....	4
Total.....	46

(INCLOSURE No. 3.)

Statement by divisions, showing the number of gas buoys in service throughout the Dominion during the fiscal year 1909-10.

District No.	District.	Type.						Total.
		5 & 6	7 & 8½	9 & 9½	11	14	*C	
1	Nova Scotia.....		8		20	2		30
2	New Brunswick**.....	2	10	8	3			23
3	Prince Edward Island***.....	1		5				6
4	Quebec.....		22				11	33
5	Platon-Montreal.....		19				47	66
6	Montreal-Kingston****.....	7	36					43
7	Lake Ontario.....	1	1					2
8	Lake Erie.....		4					4
11	Thames River.....		1					1
12	St. Clair River.....		1					1
13	Sarnia.....		1					1
14	Goderich.....		1					1
15	Southampton.....		1					1
16	Georgian Bay.....		13	1	2			16
17	Sturgeon River.....	1						1
18	Sault Ste. Marie.....	2	3					5
19	Port Arthur.....		3					3
24	British Columbia.....		9	8				17
		14	133	22	25	2	58	254

\* Compression.  
\*\* Nine buoys on the Nova Scotia coast have been included here, as they are attended to by the New Brunswick Agency.  
\*\*\* One buoy on the New Brunswick coast has been included here, as it is attended to by the Prince Edward Island Agency.  
\*\*\*\* Eleven buoys on the St. Lawrence river have been included here, as they are attended to by the Dominion Lighthouse Depot, Prescott, Ont. staff.



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(INCLOSURE No. 4.)

Statement giving the complete list of stations at which gas buoys were in operation throughout the Dominion during the fiscal year 1909-10.

## UNDER THE NOVA SCOTIA AGENCY.—DISTRICT No. 1.

Station No.	Name of Station.	Description of Buoy.
24	Pubnico .....	Gas and whistling.
27	Cape Sable, Southwest Ledge .....	"
29	Brazil Rock .....	"
32	Shelburne .....	"
35	Lockeport .....	"
37	Little Hope .....	"
39	Liverpool .....	"
40	Liverpool Fairway .....	Gas and bell.
45	La Have .....	"
48	Lunenburg .....	Gas and whistling.
49	Lunenburg, East Point Ledge .....	Gas and bell
54	North East Shoal .....	Gas and whistling.
60	Sambro .....	"
61	Outer Automatic, Halifax Harbour .....	"
62	Inner Automatic, Halifax Harbour .....	"
63	Neverfail, Halifax Harbour .....	Gas.
65	Thrumcap .....	Gas and bell.
67	Middle Ground, Halifax Harbour .....	Gas.
70	Egg Island .....	Gas and whistling.
72	Sheet Harbour .....	"
76	Liscomb .....	"
80	Isaac Harbour .....	"
84	Whitehead .....	"
86	Canso or Grime Shoal .....	"
90	Cerberus Rock .....	"
94	Petitdegrat .....	Gas and bell.
100	Guion Island .....	Gas and whistle.
102	Louisburg .....	"
108	Flat Point .....	"
109	South-East Bar, Sidney .....	Gas.

## UNDER THE NEW BRUNSWICK AGENCY.—DISTRICT No. 2.

4-S.	Blonde Rock .....	Gas and whistling.
6-S.	South-West Fairway, Yarmouth .....	"
8-S.	Cape Fourchu .....	"
10-S.	Hen and Chickens, Yarmouth .....	Gas and bell.
12-S.	South West Ledge, Brier Island .....	Gas and whistling.
14-S.	North West Ledge, Brier Island .....	"
16-S.	Avon River .....	Gas.
3	Old Proprietor .....	Gas and whistling.
5	North Wolves .....	"
7	Lepreau .....	"
9	Partridge Island .....	"
18	Foul Ground, St. John Harbour .....	Gas.
20	Quaco Ledge .....	Gas and whistling.
31	Scaumenac, Restigouche River .....	Gas.
32	Point Lanim, Restigouche River .....	Gas.
34	Point LaGarde, Restigouche River .....	Gas.
36	Oak Point, Restigouche River .....	Gas.
38	Traverse, Restigouche River .....	Gas.
40	Busteed, Restigouche River .....	Gas.
42	Horseshoe Bar East, Miramichi .....	Gas.
44	Horseshoe Bar West, Miramichi River .....	Gas.
46	Young's Point, Caraquet .....	Gas.
47	Grasy Point, Caraquet .....	Gas.



Station No.	Name of Station.	Description of Buoy.
1	Indian Rocks.....	Gas and whistling.
2	Point Prime .....	"
3	Fitzroy Rock.....	"
4	Mid Straits.....	"
5	Miscouche Shoal.....	"
6	Zephyr Rock, Shediac Bay, N. B.....	Gas.

UNDER THE QUEBEC AGENCY.

District No. 4.

27-B.	Father Point.....	Pintsch gas.
29-B.	Rimouski Road.....	"
38-B.	Barrett Ledge.....	" gas and bell.
51-B.	Pilgrim Shoal.....	Gas and bell.
56-B.	Traverse, Middle Ground.....	Gas.
58-B.	Middle Ground Centre, Opposite Lower Traverse Pier.....	"
59-B.	Lower Traverse.....	"
60-B.	Middle Ground, Traverse, Southwest extremity.....	"
64-B.	Channel Patch.....	Pintsch, gas and bell.
65-B.	Port Joli .....	Gas.
67-B.	Beaujeu Bank, Northeast extremity. ....	" and bell.
69-B.	Beaujeu, New Channel, left hand.....	Gas.
70-B.	Beaujeu Bank, Southwest of stream.....	" and bell.
77-B.	St. Thomas ...	Gas.
80-B.	Quarantine or Grosse Isle .....	"
86-B.	Madame Island Reef.....	"
87-B.	Beaumont Reef.....	"
89-B.	Point Levis.....	"
96-B.	Lark Reef, South end.....	Pintsch gas.
102-B.	Morin Shoal.....	Gas.
106-B.	Grand Pointe.....	Pintsch gas.
110-B.	Eastern Narrows, North Traverse. ....	"
10-Q.	Fly Bank.....	Gas.
15-Q.	Point Nicholas .....	"
24-Q.	Pointe aux Trembles.....	"
28-Q.	Point St. Antoine.....	"
34-Q.	Ste. Croix.....	"
44-Q.	Cap Sante ..	"
49-Q.	Point Platon.....	"

MONTREAL DIVISION.

District No. 5.

2-C.	Point Citrouille .....	Gas.
15-C.	Champlain or Pouillier Carpentier.....	"
20-C.	Ile Bigot.....	"
23-C.	Becancour, Lower Traverse.....	"
30-C.	Becancour Bend.....	"
39-C.	Becancour, Upper Traverse.....	"
43-C.	Cap Madeleine.....	"
55-C.	Ile aux Cochons.....	"
59-C.	Three Rivers Shoal .....	"
4-L.	Pouillier Laforce .....	"
9-L.	English Bank. ....	"
13-L.	Curve No. 3.....	"
17-L.	" .....	"
21-L.	" .....	"
25-L.	" .....	"
35-L.	Pointe du Lac course.....	"
47-L.	" .....	"
57-L.	Yamachiche Bend .....	"
58-L.	" .....	"



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MONTREAL DIVISION—*Con.*

*District No. 5—Con.*

Station No.	Name of Station.	Description of Buoy.
67-L.	Curve No. 2 to White Buoy .....	Gas.
79-L.	" .....	"
85-L.	" .....	"
91-L.	Curve No. 1 to Curve No. 2 .....	"
97-L.	" .....	"
103-L.	" .....	"
111-L.	Ile aux Raisins .....	"
123-L.	Pointe aux Soldats .....	"
136-L.	Ile de Grace .....	"
146-L.	Nepigon Shoal .....	"
1-M.	Hay Island or Ile aux Foins .....	"
5-M.	St. Ours Traverse .....	"
16-M.	Bellmouth Curve .....	"
20-M.	" .....	"
24-M.	" .....	"
31-M.	Centrecœur Bend .....	"
45-M.	Centrecœur Junction .....	"
82-M.	Plum Island .....	"
89-M.	Verchères .....	"
103-M.	Pouillier des Trois Bouées .....	"
117-M.	Cap St. Michel .....	"
124-M.	Ile des Lauriers .....	"
129-M.	Varennas Curve .....	"
133-M.	Varennas Curve .....	"
149-M.	Pointe aux Trembles Bend .....	"
167-M.	Pointe aux Trembles Curve .....	"
174-M.	Longue Pointe .....	"
177-M.	Pouillier à Gagnon .....	"
181-M.	Longueuil .....	"
191-M.	Longueuil .....	"
193-M.	Longueuil .....	"
194-M.	Maisonneuve .....	"
195-M.	Ile Ronde .....	"
196-M.	Longueuil .....	"
52-Q.	Portneuf .....	"
68-Q.	Batture Simon .....	"
73-Q.	Batture du Chêne .....	"
77-Q.	Batture à Cadieux .....	"
80-Q.	Cap Charles .....	"
90-Q.	Cap à la Roche Curve .....	"
97-Q.	Upper Cap à la Roche .....	"
105-Q.	Cap Levard .....	"
110-Q.	Cap Levard .....	"
115-Q.	Batiscan Course .....	"
119-Q.	Batture St. Pierre .....	"
123-Q.	Batiscan Anchorage .....	"
129-Q.	Batture Perron .....	"

UNDER THE PRESCOTT AGENCY.

*District No. 6.*

25-F.	Grosse Point .....	Gas.
30-F.	Soulanges canal, entrance .....	"
36-F.	Coteau Landing .....	"
40-F.	Hay Point .....	"
43-F.	West end of Middle Ground .....	"
46-F.	Port Lewis .....	"
48-F.	Point Mouillé Flats .....	"
64-F.	Lancaster .....	"
68-F.	Island Bank .....	"
69-F.	East Lancaster Bar .....	"
76-F.	Lancaster Bar .....	"
78-F.	Squaw Island .....	"
84-F.	Clarks Island .....	"



UNDER THE PRESCOTT AGENCY—*Con.*  
*District No. 6—Con.*

Station No.	Name of Station.	Description of Buoy.
88-F.	Colquhoun Island .....	Gas.
96-F.	St. Regis Dyke, West end.. ..	"
16-S.	Four-fifth mile above Lachine.....	"
18-S.	Foot of dredged cut above Lachine.....	"
38-S.	Lachine Cut, upper entrance.....	"
48-S.	East of Lightship No. 2.....	"
53-S.	Off Browns Point.....	"
76-S.	Between Light No. 2 and Light No. 3.....	"
86-S.	Between top light and Ile Perrot.....	"
98-S.	Windmill Point .....	"
100-S.	Entrance to Soulanges Canal, East.....	"
102-S.	Entrance to Soulanges Canal, East.....	"
104-S.	Soulanges Canal, East.....	"
2-T.	Brockville Narrows.....	"
4-T.	Hillcrest.....	"
6-T.	Cole Shoal, Middle Ground.....	"
8-F.	Fiddlers Elbow .....	"
12-T.	Gananoque Narrows.....	"
38-T.	Wolf Island.....	"
46 T.	Cold Bath Shoal.....	"
61-T.	Penitentiary Shoal.....	"
69-T.	West end of Middle Ground, between Snake Island and Seven Acre Shoal.....	"
102-T.	Northport Shoal.....	"
110-T.	Trenton .....	"
6-U.	Delaney Shoal.....	"
8-U.	Archibald Shoal.....	"
40-U.	Farran Point.....	"
54-U.	Prunner Shoal.....	"
127-U.	Dixon Island.....	"
136-U.	Upper entrance, Iroquois Canal.....	"
138-U.	" " " .....	"

ONTARIO DIVISION.

*Lake Erie, District No. 8.*

1	Bar Point.....	Gas.
2	Grub Reef.....	"
5	West side eastern entrance, Bar point channel.....	"
6	East " " " .....	"

*Thames River, District No. 11.*

1	Thames River.....	Gas.
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*St. Clair River, District No. 12.*

1	Courtwright.....	Gas.
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*Sarnia, District No. 13.*

1	Point Edward.....	Gas .....
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ONTARIO DIVISION—*Concluded.*

*Goderich, District No. 14.*

Station No.	Name of Station.	Description of Buoy.
2	Goderich Fairway.....	Gas.

*Southampton, District No. 15.*

4	Chantry Island, North.....	Gas.
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*Georgian Bay, District No. 16.*

1-P.	Vails Point.....	Gas and bell.
2-P.	Hooper Island.....	Gas.
3-P.	Middle Ground.....	"
4-P.	Three Star Shoal.....	"
5-P.	Seguin Bank .....	Gas and whistling.
6-P.	Lone Rock.....	" "
7-P.	Lockerbie Rock.....	Gas.
8-P.	Surprise Shoal.....	Gas and whistling, and
10-P	Kennedy Bank.....	Gas. bell.]
1-B.	Maganatawan Ledges.....	Gas.
2-K.	Entrance, Key Inlet.....	"
8-K.	Murray Bend, ".....	"
14-K.	Keefer Bend, ".....	"
20-K.	Digsby, ".....	"
24-K.	Mann reef, ".....	"
26-K.	Inside, ".....	"

*Sturgeon River, District No. 17.*

1-N	Sturgeon Bar .....	Gas.
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*Sault Ste. Marie, District No. 18.*

1	Vidal Shoal, north side, upper end.....	Gas.
2	" south side ".....	"
3	" north side, lower end .....	"
4	Upper Entrance, south side.....	"
5	" north side .....	"

*Port Arthur, District No. 19.*

1	Port Arthur .....	Gas.
2	Southeast Dredged Channel, Fort William.....	"
3	Northeast " ".....	"



BRITISH COLUMBIA DIVISION.

District No. 24.

Station No.	Name of Station.	Description of Buoy.
1	Lookout Island.....	Gas beacon.
2	Kyuquot.....	Gas and whistling.
19	San Juan.....	"
23	Lewis Reef.....	Gas beacon.
24	Kelp Reef.....	"
25	Dock Island.....	"
27	Helen Point.....	"
29	Walker Rock.....	"
30	Coffin Islet.....	"
31	Danger Reef.....	"
32	Joan Point.....	"
33	Gabrola Reef.....	"
35	Sand Head.....	Gas and whistle.
36	Grey Point.....	Gas and bell.
37	First Narrows, Vancouver Harbour.....	Gas beacon.
40	Sechelt.....	"
42	Gallows, Point, Nanaimo Harbour.....	"
43	West Rocks.....	"
44	Goose Spit.....	"
45	Kelp Bar.....	Gas and bell.
47	Oyster Bay.....	"
49	Lund.....	Gas beacon.
52	Gillard Island.....	"
53	Maud Island.....	"
54	Chatham Point.....	"
58	Haddington Reef.....	Gas.
64	Zero Rock.....	Gas beacon.
67	Fog Rocks.....	"
70	Dall Patch.....	Gas and whistle.
72	Vancouver Dock.....	"
74	Boat Bluff.....	Gas beacon.
84	Klewnuggit.....	"
86	Watson Rock.....	"
88	Marked Tree Bluff.....	"
89	Holland Roek.....	"
92	Casey Point.....	Gas.
93	Georgia Rock.....	Gas and bell.
94	Spire Ledge.....	Gas.
95	Barrett Rock.....	"
96	Coast Island.....	Gas beacon.
97	Ridley Island.....	"
101	Alford Rock.....	Gas.
103	Hodgson Reef.....	Gas and whistling.
105	Pointers.....	Gas beacon.
107	Browning Entrance.....	Gas whistle.
110	Skidegate or Lawn Point.....	Gas and bell.
112	Copper Island.....	Gas beacon.

The whole respectfully submitted.

J. G. MACPHAIL,  
*Acting Commissioner of Lights.*

Commissioner of Lights Office,  
Department of Marine and Fisheries,  
Ottawa, March 31, 1910.



## APPENDIX No. 3.

## RIVER ST. LAWRENCE SHIP CHANNEL.

The Deputy Minister, Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to present the following annual report on the operations for the improvement of the River St. Lawrence ship channel during the fiscal year ending March 31, 1910.

I have to acknowledge with very great pleasure that the success of the operations is due in a large measure to the skill and energy of the staff in charge, and also to the untiring and careful work of the crews of the different vessels.

I have the honour to be, sir, yours obediently,

V. W. FORNERET, B.A.Sc.,  
*Superintending Engineer.*

The ship channel of the River St. Lawrence, between Montreal and Father Point, has a total length of about 340 statute miles.

The contracted part of the river, which may properly be called 'ship channel,' commences at the Traverse, to which point from Montreal, the distance is 220 miles.

The length of channel actually requiring improvement by dredging from Montreal to the Traverse, is about 70 miles. The length of the 30-foot channel actually completed at the close of navigation, 1909, is  $62\frac{1}{2}$  miles, leaving  $7\frac{1}{2}$  miles yet remaining to be dredged, in order to give a clear depth of 30 feet at low tide during the lowest stage of the river level.

From Montreal to Batiscan the tide is not available for navigation, and in order to enable vessels to load to full depth, the dredging of this part of the river was first undertaken, and is now completed.

The completed channel has a minimum width, in the straight portions, of 450 feet, and on the curves from 500 to 800 feet. The widening has all been completed except for a distance of about 2,000 feet in the straight portion of Lake St. Peter below White buoy curve.

As the dredging is completed, the channel is swept, and, therefore, an available depth of 30 feet exists from the sea to Montreal, advantage to be taken of the tide up to Batiscan.

## PHYSICAL FEATURES.

It is probable that there is no river in the world better adapted for improvement than the St. Lawrence.

The Great Lakes act as storage reservoirs and settling basins.

Except for floods during the ice accumulations, the fluctuations in level are gradual and not excessive.

The position of the St. Lawrence is the reverse of most rivers. The usual condition of a river is, from the source, steep slopes which erode the banks and transport coarse material, which, as the slope becomes more gradual, decreases until at the mouth of the river the water carries in suspension a fine sediment which deposits, to the great detriment of navigation.



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In the St. Lawrence the material from most of the sources of supply is all deposited in the settling basins. From the lakes to the ocean the bottom of the river is usually hard, so that we have not only clear water, but a permanent bed.

The nature of the material composing the bottom of the river, though in many places very difficult to dredge, is for the same reason of such a character that a dredged cut once made is substantially permanent.

In the ship channel the material to be excavated varies from soft blue clay into which a pole may be planted some six or seven feet by hand, to stiff clay, to hardpan as hard as a macadamized road, to shale rock and large boulders. In one or two localities we find coarse sand, to which points dredging has to some extent to be repeated.

The currents of the St. Lawrence are, for a river of such a size, not only reasonable and regular, but altogether free from the usual dangers to navigation resulting from freshets.

The winter season, with its ice and snow, is the one great drawback to the St. Lawrence. This route, however, with its seven months' season of navigation, is one of the greatest factors in the success of the Canadian transportation system.

The successful work accomplished by the ice-breaking steamers during the last two years proves that the season of navigation can be lengthened materially.

#### HISTORY OF THE SHIP CHANNEL.

The St. Lawrence owing to its situation, is the natural route from the Atlantic to the northern and northwestern half of the North American continent.

The opening of the Lachine canal, connecting Montreal with the Great Lakes in 1825, established the route commercially.

The light-draught sailing vessels could then reach Montreal without trouble, except during a few weeks in the autumn when they resorted to lightering.

In 1844, it was in an effort to give navigation up to Montreal for vessels of 500 tons, that the first work of dredging was undertaken.

The first proposals for improvements were discussed in 1825, the national character of the work being then recognized. Surveys were made and reported upon in 1831, and again in 1838.

In 1841, during an investigation, the committee proposed a tonnage duty sufficient to provide for the cost of the improved channel, which it was considered would be less than that of lighterage. It was, however, agreed that 'in order to draw the produce of the west down the St. Lawrence, it was expedient to make the transit charges as light as possible.'

Operations were commenced by the 'Board of Works' in 1844 and continued until 1847, when, owing to opposition as to the location of the channel the work was abandoned. After sixty years, it is now considered that the straight channel as commenced would have been preferable in many ways.

In 1850, the Harbour Commissioners of Montreal proposed that they could do the work more economically and expeditiously. They asked for authority to undertake the work and to charge a tonnage duty to pay for the eight per cent interest and two per cent sinking fund.

This plan was adopted in August, 1850, and the commissioners were authorized to proceed in such a manner as they should deem best, the government plant being transferred to them.

The Harbour Commissioners, after examination and the best advice obtainable, adopted the location of the deepest natural channel in Lake St. Peter. This results in the present channel with five tangents, instead of two long straight courses as at first commenced.

The original depth through Lake St. Peter was 10 feet 6 inches.



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From 1850, the channel was deepened from stage to stage until in 1888, when the debt amounted to somewhat over three million dollars, the government decided to complete the channel as a national work, and to assume the debt, and from that day the channel has been open free to the commerce of the world.

At that date the channel had been deepened to 27½ feet at ordinary low water from Montreal to Cap à la Roche, and from there to Quebec the tide was available.

Nearly 20,000,000 cubic yards had been dredged at an average cost of about 20 cents per yard, including the cost of the plant.

A dredge of the type of 1846, excavated in Lake St. Peter in one day, 1,200 cubic yards. By wonderful improvements in 1888, the dredge of that time could make 7,200 yards without trouble. At the present time, working day and night, the Lake St. Peter dredge removes at a fairly average rate, 20,000 cubic yards per day.

The work was conducted by the Department of Public Works of Canada from 1889 until 1904, when the management and control of the river, together with the shops and dredges, were handed over to the Department of Marine and Fisheries, which department had general charge of navigation.

At the present time a splendid channel of 30 feet at extreme low water exists from Montreal to Cap à la Roche, and to Quebec by taking advantage of the tide.

The success of the work is in a great measure due to the geographical situation of the route, the physical features of the river favourable for improvement, the determination and public spirit of the business men and industrial corporations of Montreal, and to the recognition by the Government of Canada of the national character of the project.

## THE PRESENT PROJECT.

The present project for a 30-foot channel between Montreal and Quebec was adopted in 1889, while the improvements below Quebec were decided upon in 1906.

The estimate of 1899 was for ten years' work. The plant was only partially available until 1903.

The project for the channel between Montreal and Quebec had in view a channel of 30 feet depth, at the extreme low water of 1897, from Montreal to tide water at Batiscan, and from Batiscan to Quebec at extreme low tide. The width contemplated was a minimum of 450 feet in the straight portions and from 550 to 750 feet at the bends. An anchorage was to be provided for Lake St. Peter.

Of this work, the 30-foot channel from Montreal to tide water at Batiscan was completed in 1906. This is now in use, deep-draught vessels in the autumn waiting for tide, to pass Cap à la Roche and St. Augustin bar.

The work remaining to be done is about two miles of shale rock at Cap à la Roche; about one mile at Grondines; about one mile at St. Augustin bar; also about one mile of widening at Ste. Croix, and one-half mile of widening in Lake St. Peter.

Cap à la Roche will probably take from three to four years to complete, while the remainder to Quebec should be completed at the same time, or in one year longer.

The project of work below Quebec, had in view a 30-foot channel at low tide at St. Thomas flats, and at Beaujeau bank, everywhere 1,000 feet wide.

The Beaujeau bank channel was completed in 1909.

The St. Thomas flats, where the material is clay and sand, and covering four miles of channel, should be finished in about three years.

## ACCIDENTS IN 1909.

Only two serious accidents occurred in the River St. Lawrence during the season of 1909, one between Montreal and Quebec, the river boat *Pierreville*, which on June 17 collided with the ss. *Torgorm* and sank just outside the ship channel opposite Ile au Raisin.



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The other accident was the grounding of the ss. *Campana* near Pointe Ste. Michel, below Quebec. Several attempts were made to float her, but she was finally abandoned, a total wreck.

The minor accidents were as follows:—

*Between Montreal and Quebec—*

SS. *Corinthian*, Allan line, grounded in the Richelieu rapids on April 30 during heavy snowstorm. Refloated.

SS. *Spheroid*, grounded at Cap Charles on June 25. Broke propeller blade. Refloated.

SS. *Montezuma*, Canadian Pacific Railway steamship line, touched on south bank at Cap à la Roche on September 16.

SS. *Dominion*, White Star-Dominion line, grounded at Cap à la Roche on November 17. Refloated.

*Between Quebec and Father Point—*

SS. *Odland*, grounded on May 31 on shoal extending from Pointe au Pic, north shore, River St. Lawrence. Refloated.

SS. *Urania*, grounded on reef extending from White island, River St. Lawrence, on August 7. Refloated.

SS. *Wacousta*, grounded at Goose island on September 28. Refloated.

SS. *Ocean*, grounded on Red island, River St. Lawrence, on September 28. Refloated.

SS. *Georgetown*, grounded on Hare island, River St. Lawrence, on September 29. Refloated.

#### SWEEPING OPERATIONS.

Although with the exception of some minor shoals at Champlain, there is practically no filling in, and although, since the commencement of the ship channel project, no actual boulders have been known to have been carried into the dredged channel, such conditions being possible, it has been decided that once a year the dredged and shallow channels shall be swept.

The problem of sweeping the ship channel thoroughly is a matter of great importance and difficulty. The work has to be carried out with very great care, and good weather conditions are required.

Mr. N. B. McLean, with three assistants, is in charge of the sweeping operations.

A twin-screw steamer, and a testing scow, make up a sweeping plant. When in operation, the bow of the steamer fits into a 'V' shaped groove in the stern of the testing scow which is securely fastened to the steamer by means of strong wire ropes, one on either side, so that the scow is propelled and steered by the steamer.

A steel roller, 40 feet long by 1 foot in diameter, and weighing about two and a half tons, is suspended under the scow to the required depth, and sweeps the channel against the current, running a sufficient number of parallel lines to overlap each other, so as to cover the whole of the ground.

Fogs or smoky weather will interrupt the work, because the shore marks cannot be seen for guidance in running the parallel lines. The work has to be stopped also during rough weather. As the work of testing is always done in the channel, a great deal of difficulty and interruption is caused by passing vessels.

In tidal water the depth is constantly changing, which necessitates frequent raising or lowering of the steel bar. This is done by the aid of a winch on the scow, the steam for which is obtained from the steamer by means of a flexible steam hose.

If an obstruction is found while testing, its position is fixed by simultaneous sextant angles taken by two engineers who stand on the bridge of the scow over the suspended roller. These angles are plotted on a chart with a station pointer, so that



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when the sweeping is finished in one locality, the positions of obstructions, if any, are located and shown on the chart. It is then an easy matter to have these removed by a dredge or stone-lifter, as the case may be.

The extent of the work may be inferred from the fact that where the channel is 300 feet wide, eight lines are required to be run, and where the channel is wider, it takes from 11 to 15 lines, and up to 22 on the curves.

At the beginning of the season, it is usual to run four lines of testing from Montreal to Batiscan through the dredged channel, and afterwards the channel is tested more thoroughly.

The work below Batiscan, including Cap à la Roche, where the current is strong, and the weather frequently stormy, is usually postponed until about midsummer.

Previous to the work below Quebec being commenced, one sweeping plant was sufficient, but at present two outfits are kept busy covering the ground required to be tested.

During last season, 366 miles of long lines were run, and 60 miles of dredged channel thoroughly swept, which required 500 lines to be run, or a total length of 785 miles. This made a total of 1,153 miles of testing lines, which necessitated 2,000 miles of actual running of the sweeping outfits.

During the season of 1909, no obstruction of any serious nature was found.

## MARINE SIGNAL SERVICE.

*River St. Lawrence Ship Channel.*

There are twelve stations established at the following places:—

	Distance in nautical miles from Montreal.	In operation.
Montreal.....	00	Day and night.
Longue Pointe.....	5	"
Vercheres.....	19	During daylight.
Sorel.....	39	Day and night.
Three Rivers.....	71	"
Batiscan.....	87	During daylight.
St. Jean des Chaillons.....	93	Day and night.
Portneuf.....	108	During daylight.
St. Nicholas.....	127	Day and night.
Cap Rouge.....	132	During daylight.
Quebec.....	139	Day and night.
Crane Island.....	171	"

The above stations are connected by a private through telephone system, terminating at Quebec and Montreal, with the exception of Crane island, which communicates with Quebec via the Bell Telephone Company's system.

Each station has a mast 60 feet in height, with cross spar 25 feet long about 20 feet from the top of the mast.

When a station is in operation, a 'Jack' is hoisted to the masthead during daylight, and a white light at night.

Signals displayed at west end of cross-spar indicate river or points above station. Signals displayed at east end of cross-spar indicate river or points below station.

For other communications between vessels and stations or vice versa, the International Code of Signals is used.

The telephone service was started on September 1, 1907, and the system of signals on November 5, 1908.



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The combined service of telephone and signals has been very useful, and general satisfaction has been given. It is of great value in reporting weather conditions. Information as to the whereabouts of vessels can also be obtained, and signals to passing vessels recorded.

This service has also proved useful in connection with the dredging operations, as, in the event of breakages, &c., communication can immediately be obtained with the shops at Sorel, where orders can be given for repairs, and owing to the promptness of the service a great deal of valuable time has been saved.

In the spring of 1909, the Shipping Federation of Canada suggested that cones, balls and drums be substituted for flags in a special code used at the signal stations between Quebec and Montreal, owing to the fact that during calm spells flag signals could not be distinguished. This proposal was submitted to the department and approved. Arrangements were then made for this change, and after being in operation for several months last season, the shapes have proved to be more satisfactory than the flags.

During the summer, the Sorel and Longue Pointe station buildings were raised several feet to obtain a better view and also to give more room.

Alterations were also made to the Quebec station to give better accommodation.

On February 24, 1910, the Montreal office was transferred from the Harbour building to the Boyer block, 223 Commissioner street, where more suitable quarters were obtained. The offices of the different branches of the department are in this building.

After negotiating for two years, the old Windmill property at Vercheres, P.Q., was finally acquired by the department, and possession was taken on April 1, 1909.

Two objects were attained by this transaction, viz.:—

(1) In making use of the old stone mill as a signal station, being well situated.

(2) In preserving this building, and saving it from destruction, as it is one of the oldest historical buildings in Canada. It was in very bad condition, but was repaired, and it is now considered to be one of the best signal service stations.

The following are a few notes concerning the history of the old Windmill furnished by the parish priest at Vercheres, who had made extensive researches concerning the matter:—

Vercheres was founded about 1667 by M. de Vercheres, an officer in Carignan's Regiment, to whom the Vice-Roy or Governor of New France had conceded a piece of land, now known as the parish of Vercheres.

M. de Vercheres immediately founded an establishment there, which he defended against the attacks of the Iroquois, with the aid of a few colonists.

The most important event during the early days of the colony of Vercheres, was the defence of this establishment by Mlle. de Vercheres in 1692.

In the spring of 1692, a party of Iroquois attacked the colony. Most of the colonists were away clearing land, and M. and Mde. de Vercheres were absent on a voyage to Quebec for the purpose of securing assistance from the governor for his tenants.

Mlle. de Vercheres, with the aid of two old experienced soldiers, had taken refuge in the fort, which had been built near the river side, and from this fort she defended the colony of Vercheres, and repulsed the Iroquois, who would probably have set fire to the place and destroyed all life and property.

It is rightly supposed that the fort of Vercheres is no other than the 'Old Windmill' situated near a creek, and opposite the Richelieu and Ontario Company's wharf.

Old documents and the actual site of the mill prove the foregoing. We also read in the History of Canada by Ferland, that the fort of Vercheres was situated near a small river which flowed into the River St. Lawrence close to the site.

This old mill was built in the year 1690.



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## ICE-BREAKING OPERATIONS, 1909-10.

I have the honour to submit the following report, for the information of the department, on the ice-breaking operations between Montreal and Quebec, by the steamers *Lady Grey* and *Montcalm*.

The success of the work is shown by the results obtained.

On March 15, 1910, I instructed Mr. N. B. McLean, assistant engineer on the ship channel staff, to proceed to Quebec, and take charge of the work of breaking the ice above Three Rivers. Previously, he made periodical trips during the winter, and reported progress.

Great credit is due not only to Mr. McLean, but to all the officers, for the efficient manner in which they carried out these operations.

The important data which was collected, will be of great value in future.

Dr. H. T. Barnes, Professor of Physics, McGill University, with the consent of the department, placed his assistant, Mr. L. V. King, on board the *Lady Grey*, where he remained all winter recording water temperatures, and valuable information was obtained.

The ice-breaking operations in the River St. Lawrence for the winter of 1909-10 were brought to a close with the arrival of the *Lady Grey* and *Montcalm* in Montreal harbour on April 3, this being sixteen days earlier than in 1909.

On consulting records which go back to 1854, we find that April 2, 1903, was the only occasion when the river was open at an earlier date.

In 1909, the *Montcalm* opened navigation on April 19, ten days earlier than the previous year. This was a very distinct success, when the fact is taken into consideration that the river was frozen over solidly, from Montreal to Cap Rouge, and that at the latter point a heavy jam, roughly three and a half miles long, had to be cut through.

The work of the *Montcalm* in 1908-9 having proved satisfactory, it was decided to reorganize the ice-breaking service, and attempt to get even better results. The conclusions drawn from previous operations were that two boats working together could in all probability keep Cap Rouge clear, and that if the ice were prevented from jamming there, the river above would remain open, at least as far up as Batiscan, and possibly to Three Rivers. With this object in view, the *Lady Grey* was detailed to assist the *Montcalm*.

The plan of operations was to patrol the river, once a day with one steamer, from Quebec to St. Nicholas, the other remaining at Quebec on 'stand-by.' At the first sign of jamming, both ships were to proceed at once to the danger point, and clear a passage with the least possible delay.

This plan was followed throughout the winter, and worked satisfactorily, as the results show. On two occasions, January 20 and March 15, jamming actually took place at Cap Rouge, but the two ice-breakers working together had no difficulty in clearing a passage in from two to three hours. Had there been, however, only one ship available for work, especially in the case of the jam of January 20, it is probable that the result would have been different. It is not likely that one ship could have made headway fast enough to have cut through in the face of the constantly increasing mass of ice coming down from above.

On several other occasions large battures were broken up by the ice-breakers, which otherwise would certainly have jammed at Cap Rouge.

There is no doubt that, had the ice-breakers not been working, the same ice-conditions would have existed as in the winter of 1908-9, i.e., the river covered with ice from Montreal to Quebec, and the opening occurring just as late.

As had been anticipated, with Cap Rouge clear of ice, the river above remained open all winter, to a short distance above Three Rivers.

On March 16, the *Lady Grey* left Quebec for Three Rivers, to commence the work of breaking up the ice in the upper reaches of the river, leaving the *Montcalm* at



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Quebec as a rear guard for Cap Rouge in case any further jamming should take place there. This was not likely to occur, as the battures from Les Ecureuils to Cap Rouge were practically all gone, and those above, between Les Ecureuils and Three Rivers, were all light and narrow, and generally much smaller than in the previous year.

The trip of the *Lady Grey* from Quebec to Three Rivers on the above date is the record for winter navigation on the St. Lawrence above Quebec. The weather conditions were very unfavourable. Snow was falling practically all day. Time and again progress could only be made with the telegraph set at 'dead slow' and the lead line going, and on one or two occasions the only guide was the edge of the batture ice, no other marks being visible.

The work done by pilots Laforest and Perreault, who were in charge of the ship on this occasion, navigating without buoys and at times without marks, speaks for itself.

On the morning of March 17, one and a half miles above Three Rivers, the *Lady Grey* began the work of opening the channel, a narrow cut being made from 200 to 300 feet wide. This work continued day by day till eventually the head of the cut had been carried up to a point one mile above No. 2 lightship, a distance of 21 miles from where the work commenced. The length of channel opened varied from day to day. The least advance made was two miles for a short day, and five miles was the best day's work, which is the record cut for one ice-breaker.

The hardest part of the work is in opening the first narrow channel. After this is done, there is no difficulty in widening, as the ice must split out to the free side. Widening was done every day going and coming from work. Good results were obtained from wave action, that is to say the swell made by the ship is used to break up the ice on either side of the channel. One edge is followed as closely as possible with the ship at full speed, and the waves break up the ice from 25 to 100 feet in width according to its thickness. On the return trip the other side is followed. By this means the channel is constantly being widened with no loss of time. The ice broken varied in thickness from 18 to 24 inches.

The battures from Platon to Quebec having practically all gone, and there being no further danger of a jam at Cap Rouge, the *Montcalm* came up the river, and joined the *Lady Grey* at Three Rivers on Sunday, March 20. From this date until the close of the operations the two boats worked together, the *Lady Grey* opening the channel and the *Montcalm* widening.

It was not considered safe to carry the cut up any higher than the point one mile above No. 2 lightship for fear of the ice moving, and the ship being caught and forced on to the bank. All efforts were then devoted to widening, and by March 30 the foot of the lake was open from No. 3 curve south to Nicolet pier, and from there the open water gradually narrowed up to the White buoy curve, where it was about 400 feet wide, and the channel above this point averaged from 200 to 300 feet in width.

From March 24 to 30, there was some loss of time owing to the ice-breakers not being able to go in very far on the banks, the water not being high enough; but each day as the water rose they were worked in to the limit of their draught, and finally had cut in very much further than had ever been attempted before, this being accomplished by working very slowly and carefully, and with the aid of the lead.

On Thursday, March 31, the lake ice began to move, and on that date and April 1 the two ice-breakers were very busy keeping it in motion. On several occasions it jammed, but with the two ships it was a matter of small difficulty to cut the key and get it running again.

By noon of April 2 practically all the ice between the ship channel and the south shore of Lake St. Peter had passed the foot of the lake, but the ice on the north side of the channel was still in place. This ice was so soft and so badly honeycombed that it was really of no consequence; however, to make absolutely certain that it would pass out without jamming, the *Montcalm* was left on guard at Port St. Francis. The *Lady Grey* proceeded to Sorel, running up all the way in almost clear water.

From Montreal to the head of the lake, the channel had been open for several days.



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On Sunday, April 3, the *Lady Grey* left Sorel at 5 a.m., and went straight through to Montreal, arriving at 9 a.m.

On reaching Lake St. Peter on the morning of April 3, the *Montcalm* proceeded direct to Montreal, as it was found that all the ice on the north side had passed out during the night. She arrived at Montreal at 2.35 p.m., and with her entry into port, the ice-breaking operations for the season of 1909-10 were brought to a close, and the river was once more open to the sea.

The results to be obtained by keeping the river open in the winter, from Quebec to Batiscan or Three Rivers, may be divided into three heads:—

- (1) Preventing floods.
- (2) Earlier navigation to Montreal.
- (3) A longer season for dredging operations.

Any one of these is of sufficient importance to justify the work.

Although the operations of the ice-breakers have proved satisfactory during the last two seasons, it must be remembered that the work is still in the experimental stage, and that no hard and fast rules can be laid down, nor can any guarantee be given that the river will be open as early next spring, the conduct of the work being governed almost entirely by the circumstances of the moment. Taking the case of this year's work, it must be borne in mind that it was throughout an exceptionally mild season, and this was a very material factor in the work of keeping the river open during the winter, and in the final work of opening up to Montreal.

The operations of the last two winters have, however, proved, though no hard and fast rules may be laid down, that navigation can be opened earlier than it would otherwise be, if nature were left to take its course.

Great credit is due to Captains Mercier and Pelletier, for the manner in which they have carried out this work, good judgment and constant care being essential. They were ably assisted by their officers, and in fact by all hands, and a friendly rivalry existed between the two ships in endeavouring to do efficient work. Owing to this spirit of watchfulness and strict attention to duty, Quartermasters Belanger and Leclerc of the *Montcalm* were able to save the life of one of the outfit who was unfortunate enough to fall over the wharf at night in Three Rivers.

The department is to be congratulated upon having two such reliable crews to carry on this work.

## GENERAL INFORMATION.

One of the historical features of the season of 1909 was the completion of a century of steam navigation on the St. Lawrence; but the event was allowed to pass without any public celebration.

The first steamboat to churn the waters of this river was the *Accommodation*, which was 85 feet long. This boat started on her first trip from Montreal to Quebec on November 3, 1809. The trip occupied 66 hours, 30 hours of which she was at anchor, so that the actual time for the passage was 36 hours. At the present time some of the largest ocean liners make the run in about eight hours. The building of the *Accommodation* was due to the enterprise of John Molson, an ancestor of the present well-known Molson family of Montreal.

Another feature of the season, was the inauguration of the White Star-Dominion line service to Montreal, and the placing on the route their two new steamships, *Laurentic* and *Megantic* (each 15,000 tons).

The available depth in the Cap à la Roche dredged channel is indicated by the St. Jean des Chaillons semaphore, which was put in operation for the season on June 8, 1909.

The available depth over the undredged St. Augustin bar is indicated by the semaphore at St. Nicholas, which was started for the season on June 16, 1909.

During the season of 1909 good progress was made on the work of deepening the St. Thomas channel below Quebec. Every effort will be made to complete the north half of the channel to a width of 500 feet by the end of next season.



The Beaujeu channel below Quebec was commenced in 1906 and completed to its full width of 1,000 feet, and depth of 30 feet at extreme low tide, at the end of the season of 1909. This channel was thoroughly proved with the testing scow, and the lumps found were removed.

The annual trip of inspection of the ship channel and the works connected therewith, was made by the Honourable the Minister on October 21, 1909.

The steamer *Lady Grey* left Victoria pier, Montreal, at 9 a.m., and the inspection occupied three days, covering various works between Montreal and Crane island, below Quebec.

The minister, the Honourable Mr. Brodeur, was accompanied by his officials, representatives of the Shipping Federation, Montreal Board of Trade, La Chambre de Commerce, representatives of the Montreal and Quebec Harbour Commissioners, and the Montreal and Quebec pilots. Much satisfaction was expressed at the progress made at different points.

During this trip the Honourable the Minister made the announcement that it was the intention of the government to proceed with the deepening of the ship channel to 35 feet at extreme low water.

In order to expedite the work of deepening the channel at Cap à la Roche, an order has been given to the Lobnitz Company of Renfrew, Scotland, for a twenty-ton rock crusher, to be ready for work next season. Should this one prove successful, it is the intention of the department to procure others.

The total cost from 1851 to the end of the fiscal year, of the ship channel, including plant, shops, surveys, &c., is as follows:—

Dredging.....	\$7,781,494 21
Plant, shops, surveys, &c....	3,618,522 60
	<hr/>
	\$11,400,016 81

The total number of cubic yards dredged, the material varying from very hard shale rock to soft blue clay, amounted to 68,121,577.

Year.	AVERAGE DEPTH FOR EACH MONTH IN THE 27½ FOOT CHANNEL. (27½ feet at Ordinary Low Water.)							FROM SOREL GAUGE IN RING EACH YEAR MAY TO NOVEMBER.	
	May.	June.	July.	August.	Sept.	Oct.	Nov.	Highest.	Lowest.
	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
1890.....	35 6	35 3	31 9	30 6	30 9	29 9	30 6	37 0	29 0
1891.....	34 6	31 3	29 9	29 9	30 0	28 3	28 3	36 9	27 3
1892.....	31 0	31 9	31 6	30 6	28 9	28 3	28 3	33 6	27 3
1893.....	36 0	34 3	30 9	29 9	29 6	28 6	28 0	37 6	27 6
1894.....	34 6	31 9	31 0	29 2	28 3	28 9	29 0	36 0	27 7
1895.....	33 3	31 3	28 3	28 3	27 6	26 9	26 9	34 6	25 10
1896.....	33 6	30 6	28 9	28 0	27 6	27 9	29 0	37 0	27 4
1897.....	35 6	32 6	30 3	29 3	28 0	27 0	27 6	37 0	26 5
1898.....	31 6	30 9	29 8	28 6	28 2	28 3	28 6	32 1	26 9
1899.....	36 2	31 9	30 3	28 6	27 6	28 0	27 9	37 9	26 9
1900.....	33 6	30 9	30 6	29 6	28 1	28 9	29 2	35 9	27 4
1901.....	34 3	31 10	29 2	28 3	27 7	27 4	27 3	35 3	26 6
1902.....	32 2	32 2	32 2	29 4	28 1	28 1	29 0	34 1	27 6
1903.....	33 0	30 11	30 5	29 5	28 4	29 0	27 11	32 8	26 11
1904.....	36 3	34 5	30 9	29 5	29 5	30 4	29 3	37 4	28 1
1905.....	31 10	30 8	29 7	29 0	28 0	28 5	28 1	33 6	27 1
1906.....	32 4	31 5	29 3	29 11	27 3	27 4	27 6	33 3	26 9



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Year.	AVERAGE DEPTH FOR EACH MONTH IN THE 30 FOOT CHANNEL (30 feet at the extreme L. W. of 1897.)							FROM SOREL GAUGE DURING EACH YEAR MAY TO NOVEMBER.	
	May.	June.	July.	August.	Sept.	Oct.	Nov.	Highest.	Lowest.
	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.
1907.....	37 0	35 9	34 3	32 10	32 4	32 9	33 7	38 3	31 10
1908.....	41 5	37 10	33 10	32 10	32 0	31 0	30 6	42 4	30 0
1909.....	40 6	37 6	33 10	33 2	32 7	32 4	31 6	42 7	30 11

COST OF SHIP CHANNEL TO DATE.

Table showing the total cost of the dredging and plant, and the quantities dredged to March 31, 1909.

	Cost of Dredging.	Expenditure for Plant, Shops, Surveys, &c.	Quantities Dredged.
	\$ cts.	\$ cts.	Cubic Yards,
MONTREAL HARBOUR COMMISSIONERS, 1851 TO 1888.			
Dredging Montreal to Cap à la Roche to 27½ feet at ordinary low water, and from Cap à la Roche to Quebec to 27½ feet at half tide. . . . .	3,402,494 35	535,809 65	19,865,693
DEPARTMENT OF PUBLIC WORKS.			
Dredging consisting of widening and cleaning up of channel: deepening Cap à la Roche to Cap Charles to 27½ feet at ordinary low water, and dredging at Grondines, Lotbinière and Ste. Croix, 1889 to June 30, 1899.....	829,583 08	486,971 79	3,558,733
Project of 1899:—			
Dredging channel between Montreal and Quebec to 30 feet at lowest water of 1897, also widening to a minimum width of 450 feet, and straightening.			
Fiscal year 1899-1900.....	100,191 01	265,270 78	1,107,894
" 1900-1901.....	136,680 83	287,040 04	2,479,385
" 1901-1902.....	185,429 80	479,731 47	3,098,350
" 1902-1903 .....	255,776 55	277,703 59	6,544,605
" 1903-1904.....	276,958 59	308,765 44	4,619,260
DEPARTMENT OF MARINE AND FISHERIES.			
Fiscal year 1904-1905 .....	311,087 93	266,460 33	2,716,220
" 1905-1906.....	431,768 30	125,107 37	4,047,530
" 1906-1907, (July 1, '06, to March 31, '07).	302,677 37	80,613 26	3,001,010
" 1907-1908.....	478,209 66	179,339 78	4,831,875
" 1908-1909. ....	497,686 03	209,636 55	5,896,737
" 1909-1910.. ..	572,950 71	117,072 64	6,354,285
	7,781,494 21	3,618,522 60	68,121,577



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## DREDGES.

*Laval* (No. 1).—This is the oldest dredge in the ship channel fleet. The hull is of wood, constructed in Ottawa in 1894. The buckets are made of cast-steel for work in rock and other hard material.

During the winter of 1908-9 this dredge was given a thorough overhauling and her machinery put in good order for the next season's work.

The details of the operations for the fiscal year beginning April 1, 1909, were as follows:—

Dredge No. 1 left Sorel on May 3, 1909, and was towed down to Cap Levrard, and laid out to work on the south half of Cap Levrard channel, where she had left off the previous season, to straighten, widen and deepen the channel, the material consisting of hard clay and stones.

Owing to unusual high water, the dredge lost time at high tide, her bucket frame being too short to reach grade, but notwithstanding this delay, the dredge made satisfactory progress.

No. 1 completed the south half of the channel on July 22. The dredge was then laid out to work on the north half, and continued working until September 30, when she finished her cut. No. 1 was then laid out to work at the lower end of Cap Levrard channel, on the south half, where dredge No. 6 had worked during the early part of the season, but had to be removed, as the material was too hard for her built-up buckets, being hardpan and stones, and very difficult to dredge.

Although dredge No. 1 had cast-steel buckets, she also found the material very difficult to dredge, but finally finished the south half of this shoal on November 3. As the season was too far advanced to lay her out on the north half, No. 1 was taken up to Varennes, and laid out to work on the upper end of the curve, widening and deepening to 35 feet at low water of 1897, the material being soft clay.

The dredge continued working at Varennes until November 26, when she was taken down to Sorel to go into winter quarters.

In a total of 175 days during which dredge No. 1 was at work, her machinery was in actual operation 73 per cent of the full working time.

The total number of cubic yards dredged amounted to 274,300, at a cost of \$48,240.78, or 17<sup>58</sup>/<sub>100</sub> cents per cubic yard.

*Laurier* (No. 2).—The hull of this dredge is also of wood, having been constructed at the government shipyard at Sorel in 1897. She is equipped with a set of cast-steel buckets especially designed for work in rock and other hard material.

During the winter of 1908-9 the dredge was given the usual overhauling.

The details of the operations of this dredge for the fiscal year beginning April 1, 1909, were as follows:—

Dredge No. 2 left Sorel for Varennes on April 27, and was laid out to work at the lower end of Varennes curve to widen and deepen the channel to 35 feet at low water of 1897, the material being soft clay. No. 2 continued working there until June 1, when she was taken down to Cap à la Roche, and started to work on the curve where she had left off the previous season, widening and deepening the channel to 30 feet at low water of 1897, the material being shale rock.

The progress of this dredge was greatly retarded by the unusual large number of boulders that had to be lifted, especially during the months of August and September, when the dredge had to be dropped back to clean up a ridge found by testing.

Dredge No. 2 worked at Cap à la Roche curve until November 10, and left the following day for Varennes, being towed up by the C.G.S. *Lady Grey*. She arrived on November 12, and was immediately laid out to work on the curve to widen and deepen the channel to 35 feet at low water of 1897, the material being soft clay.

On the night of the 15th, the dredge met with a bad accident, breaking one of the side staples on the lower end of the bucket frame. In trying to lift the frame in order



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to take the dredge out of the channel, the other staple was broken, leaving the dredge quite helpless and unable to move out of the way.

The pilots were immediately notified to be careful, and to slow up when passing this dredge with steamers.

With the help of a diver and by working strenuously day and night, the frame was lifted, and the dredge moved out of the channel.

It was found that the bucket frame was strained, and as the season was about finished, it was decided to take the dredge to Sorel to go into winter quarters.

The *Laurier* left for Sorel on November 22.

In a total of 177 days during which dredge No. 2 was at work, her machinery was in actual operation 66 per cent of the full working time.

The total number of cubic yards dredged amounted to 145,082, at a cost of \$48,375.33, or  $33\frac{3}{4}$  cents per cubic yard.

*Lady Aberdeen* (No. 3).—The hull of this dredge is of steel, the complete vessel having been constructed at the Sorel shipyard in 1900. The buckets are of cast-steel for working in hard material.

This dredge was hauled out during the winter of 1908-9. Her hull was thoroughly scraped and painted and the necessary repairs made. The machinery was also given a good overhauling to be ready for the next season's work.

The details of the operations of this dredge for the fiscal year beginning April 1, 1909, were as follows:—

On May 6, the repairs to the dredge being completed and everything in good shape, dredge No. 3 was towed down to Cap Levrard, and laid out to work on the north half of Cap Levrard channel, to widen, and deepen the channel to 30 feet at low water of 1897, the material being hard clay and stones.

This dredge worked at Cap Levrard until June 3, and was then taken down to Cap Charles curve to begin work where she left off the previous season, widening, and deepening the channel to 30 feet at low water of 1897, the material being very hard shale rock and boulders. Work continued in this part of the channel until November 10.

Although working in very hard material, No. 3 had no bad breakages during the season.

On November 10, the dredge was taken up to Pointe aux Trembles (en haut), where she arrived on the 12th, and was immediately laid out to clean up some small shoals found in the channel by the testing scow, the material being coarse black sand.

The dredge was taken to Sorel to go into winter quarters on November 26, 1909.

The working time of dredge No. 3 was 172 days, the dredge being in actual operation 65 per cent of the full working time.

The total number of cubic yards removed amounted to 169,600, at a cost of \$51,060.23, or  $30\frac{1}{4}$  cents per cubic yard.

*Lady Minto* (No. 4).—This dredge is of the same type and design as No. 3, and was constructed at the Sorel shipyard in 1900. No. 4 is also provided with cast-steel buckets for dredging in rock and other hard material.

During the winter of 1908-9 the dredge was given a good overhauling and her machinery put in good condition for the next season.

The details of the operations during the season commencing April 1, 1909, were as follows:—

Dredge No. 4 left Sorel on April 27, 1909, and was towed up to Varennes curve to widen, and deepen the channel to 35 feet at low water of 1897, the material being hard clay.

On June 7, No. 4 was taken down to work in the Cap Charles channel, where she had left off the previous autumn, to widen and deepen the channel to 30 feet at low water of 1897, the material consisting of very hard clay and stones.



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This dredge stopped work at Cap Charles channel on November 11, when she was taken up river, and laid out the next day on Varennes curve to widen, and deepen the channel to 35 feet at low water of 1897, the material being soft clay.

No. 4 continued working at Varennes curve until November 26, and was taken down to Sorel to go into winter quarters.

The number of days during which this dredge was in operation was 189, and the percentage of time of actual work, 72.

The total number of cubic yards removed amounted to 388,000, at a cost of \$52,246.22, or 13<sup>46</sup>/<sub>100</sub> cents per cubic yard.

*Lafontaine* (No. 5).—This dredge was also constructed at the Sorel shipyard, and was completed in 1901. Her hull is of wood. She is fitted out with cast-steel buckets for rock, and has had her breasting winches replaced by a new type, using wire rope instead of chains for side moorings.

During the winter of 1908-9, the dredge was given a good overhauling and the necessary repairs were made to put her in working order for the next season's operations.

On April 27, 1909, No. 5 was taken up to Varennes, and laid out to work on the curve to widen, and deepen the channel to 35 feet at low water of 1897, the material being blue clay.

On June 1, she was taken down to Cap à la Roche to start work at the upper end of the curve, where she had stopped the previous season. This work consisted of widening, and deepening the channel to 30 feet at low water of 1897, the material being shale rock.

From September 16 to 20, the dredge was delayed owing to repairs to lower tumbler and bucket frame.

No. 5 finished her cut on November 5, and as the season was too far advanced to commence a new cut, it was decided to take her up to Varennes to work on the curve. She left Cap à la Roche on November 6, and arrived at Varennes on the 8th, and was immediately laid out to widen, and deepen the channel to 35 feet at low water of 1897, the material being soft clay.

On November 26 the dredge was taken down to Sorel to go into winter quarters.

The working time of dredge No. 5 was 180 days. She was in actual operation 73 per cent of the full working time.

The total number of cubic yards removed amounted to 275,400, at a total cost of \$56,198.52, or 20<sup>40</sup>/<sub>100</sub> cents per cubic yard.

*Baldwin* (No. 6).—This dredge was constructed at the Sorel shipyard in 1902, the hull being of wood. No. 6 is provided with large built-up buckets for work in soft material, but with sufficient teeth to enable the dredge to work in hardpan, &c. She was given a thorough overhauling during the winter of 1908-9.

The details of the operations of this dredge for the fiscal year were as follows:—

Dredge No. 6 left Sorel to begin the season's work on May 5. She was towed down and laid out at the lower end of the Cap Levrard channel on the south half, where she had left off the previous season, the work being to widen, and deepen the channel to 30 feet at low water of 1897.

Owing to the exceptional high water the dredge lost a great deal of time at high tide, her frame being too short to reach grade.

No. 6 found the material, which was composed of hardpan, very difficult to remove, and she finally had to be replaced by dredge No. 1, which was provided with cast-steel buckets, more suitable for this work.

On June 17 the *Baldwin* was taken up to Champlain to clean up a few sandbars found in the channel by the testing scow. After completing this on August 25, the dredge was taken down again to work on the north half of Cap Levrard channel, where dredge No. 3 had left off, the material being softer, consisting of sand and stones.



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No. 6 completed her cut on November 6, and was then taken up to Ste. Anne de Sorel to work on the Traverse, to deepen the channel to 35 feet at low water of 1897, the material being soft clay.

On November 26, the dredge was taken to Sorel to be laid up for the winter.

In a total of 175 days during which this dredge was at work, her machinery was in actual operation 70 per cent of the full working time.

The total number of cubic yards removed amounted to 487,200, at a cost of \$50,761.50, or  $10\frac{1}{100}$  cents per cubic yard.

*J. Israel Tarte* (No. 7).—This hydraulic dredge was constructed by the Polson Iron Works Company, of Toronto, Canada, in 1902.

The hull is of steel, of the same type and general design as the steel hulls of the elevator dredges Nos. 3 and 4. 'No. 7' is not self-propelling, but is moved and attended by tugs.

The vessel is held in position for feeding by six anchors, one forward, one aft, and two on each side.

The material is discharged through a 36-inch pipe, floated on steel pontoons. This discharge-pipe is connected by a swivel elbow with the dredge. The discharging end is moored to a scow which is held by two anchors. This scow is equipped with a steam boiler and winch for the purpose of changing the position of the end of the pipe-line, by means of the anchors.

The discharge pipe is about 2,000 feet long, and the material is deposited about 1,500 feet from the edge of the channel. After many years of careful observation, it has been found that none of the dredged material has been carried back into the channel.

The material is first attacked by a revolving cutter, at the end of the suction pipe, which is driven by an independent engine. It not only cuts the material, but starts it towards the inlet, and although the suction pipe is 80 feet long, heavy material, small stones, buoy anchors, &c., are sucked up with regularity. The steam for the machinery is supplied by four marine boilers.

This dredge has been greatly changed since being first put into commission, owing to extensive alterations which have been made to the machinery and discharge connections. The results obtained have been so satisfactory as to earn for this dredge the proud title of 'The Pride of the St. Lawrence.'

During the winter of 1908-9 the dredge was given a good overhauling and the necessary repairs were made to her machinery.

New water ends were fitted to two feed pumps. The breasting winches were repaired, and new cast-iron nipples were placed on the suction pipe. The pipe pontoons were hauled out, repaired, scraped and painted.

'No. 7' left Sorel to begin her season's work on April 28, 1909, being the earliest start on record for this dredge. She was laid out to work a short distance above curve No. 3, Lake St. Peter, to widen, and deepen the channel to 30 feet at low water of 1897, the material being soft clay with some stones.

Some time was lost by the pontoon anchor scow springing a leak and filling during a storm. Repairs, however, were quickly made, and the dredge recommenced work.

On June 23, the cutter-head came off, but in a very short time, with the aid of a diver, was raised and repaired.

Another accident which occurred was a break in the bow breasting winch.

Notwithstanding these delays, dredge 'No. 7' made a very successful season, having widened and deepened the channel for a distance of five miles; this beats the record for advance. There remains only 2,000 feet of widening to complete the channel between No. 3 and White Buoy curves.

The dredge was taken to Sorel to go into winter quarters on November 20, 1909.

In a total of 172 days during which this dredge was at work, her machinery was in actual operation 69 per cent of the full working time.



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The total number of cubic yards removed amounted to 2,914,139, at a total cost of \$113,719.31, or  $3^{90}/_{100}$  cents per cubic yard.

The total number of cubic yards removed by the dredging fleet in the ship channel between Montreal and Quebec during the fiscal year ending March 31, 1909, amounted to 4,653,721, at a total cost of \$420,601.89, or  $9^{03}/_{100}$  cents per cubic yard.

*Hopper-hydraulic Dredge 'Beaujeu' (No. 8), Steel Hull, Twin-screw.*—The construction of this dredge was commenced at the Sorel shipyard in 1905. She was launched in 1906, and delivered to the operating branch on November 1, 1907.

During the winter of 1908-9 the dredge was given a thorough overhauling, and put in good working order for the next season's work.

'No. 8' left Sorel for St. Thomas flats, below Quebec, on May 18, reaching Quebec on the same day. She left Quebec next morning to begin operations.

Her work consisted of dredging a channel 1,000 feet wide and 30 feet deep, at extreme low tide, through St. Thomas bank, the material being clay and stones.

It is proposed to dredge the north half of the channel first, so as to give a channel of 500 feet in width and 30 feet in depth, with as little delay as possible, and afterwards complete the south half.

Every effort will be made to complete the north half by the end of next season.

The working time of this dredge is from daylight to dark.

The *Beaujeu* continued working at St. Thomas until September 9, and was then taken to Beaujeu channel to clean up some lumps found by the testing scow, which the *Galveston* (No. 9) was unable to remove owing to the tough nature of the material. To remove these obstructions the *Beaujeu* had to resort to the method of breasting across the channel which offered a good opportunity to break in the crew to this kind of work as it was proposed to adopt this method at St. Thomas bank in order to give a good bottom to the channel.

'No. 8' had to steam up to Quebec on September 18 to have some repairs made to her suction pipe.

On September 20, the repairs being completed the dredge returned to work.

The cleaning up at Beaujeu bank was finished on October 7, and the *Beaujeu* then returned to work at St. Thomas bank, where she was laid out to begin breasting on the north half of the channel.

The dredge was again taken to Beaujeu channel on October 14, to clean up a couple of lumps found by the testing scow. This occupied only two days, after which she finished the season at St. Thomas bank. 'No. 8' left St. Thomas bank on November 18, and arrived at Sorel to go into winter quarters on November 20.

The results obtained by this dredge during the season have again been most satisfactory. The working time was from daylight to dark, and the dredge was kept in operation 65 per cent of the full working time.

During the season the dredge worked 132 days at St. Thomas channel, and made 410 loads which amounted to 779,100 cubic yards. The material consisted of clay and stones.

The dredge also worked 26 days at Beaujeu channel cleaning up spots found too difficult for the *Galveston* to dredge, making 59 loads or 104,000 cubic yards, the material being clay, sand and stones.

The total number of days during which 'No. 8' worked was 158. She made 469 loads, or a total of 883,100 cubic yards, at a total cost of \$51,306.41, or  $5^{80}/_{100}$  cents per cubic yard.

*Suction Hopper Dredge 'Galveston' (No. 9), Steel Hull, Twin-screw.*—During the winter of 1908-9 the *Galveston* was given a thorough overhauling, and her machinery was put in good order for the next season's work.



## SESSIONAL PAPER No. 21

The details of the operations of this dredge for the fiscal year beginning April 1, 1909, were as follows:—

The *Galveston* left Sorel on May 17, 1909, and reached Quebec on the same day. Next morning, the 18th, she left to commence her season's work, and was laid out to complete the Beaujeu channel to 1,000 feet in width, and 30 feet in depth at extreme low water, the material consisting of sand, gravel and stones.

'No. 9' worked very satisfactorily until July 26, when it was necessary to put her into dry dock at Lévis in order to have some urgent repairs made to her hull and hopper gates. These repairs were completed on August 5, and after coaling, the dredge returned to her work at the Beaujeu channel.

From August 19 to 21, the *Galveston* was beached to make necessary repairs to her port turbine, at St. Michel; and again from September 24 to the 27, to repair both turbines.

On October 23, the *Galveston* completed the deepening and widening of Beaujeu channel, the depth being 30 feet at extreme low tide, and the width 1,000 feet. This channel was thoroughly tested with the testing scow, and no obstructions were found.

As the season was late, it was decided to make the necessary changes in the positions of the buoys only next spring.

From October 25 to 30, the dredge worked in the North channel between St. Jean and Cap Tourmente making trial loads to ascertain where she could work advantageously in the event of the government deciding to dredge this channel. By this examination valuable information was obtained.

Trial loads were also made at Ste. Croix bar, where the *Galveston* went on November 1, but after working two days at different points, the material, which consisted of hard packed sand and stones, was found too difficult for this dredge to remove.

On November 3, the *Galveston* returned to Beaujeu bank to widen the channel on the south side to give a better slope on account of the high bank.

On November 13, 'No. 9' was beached at St. Michel de Bellechasse, to close the suction pipe opening on the starboard side and make it water-tight, in order that repairs might be made to the turbines, &c., during the winter, without having to dock the vessel.

The *Galveston* arrived in Sorel to go into winter quarters on November 17.

During the season this dredge worked 145 days, her hours of operation being from daylight to dark. She was in actual operation 72 per cent of the full working time, and made 485½ loads, amounting to 730,000 cubic yards. The material consisted of sand, some soft blue clay, and stones. The total cost amounted to \$55,360.47, or 758½ cents per cubic yard.

The total number of cubic yards removed by the *Beaujeu* (No. 8) and the *Galveston* (No. 9) below Quebec, during the fiscal year ending March 31, 1909, amounted to 1,613,100, at a total cost of \$106,666.88, or 66½ cents per cubic yard.

The total number of cubic yards removed by the whole of the dredging fleet during the season, amounted to 6,266,821, at a total cost of \$527,268.77, or 84½ cents per cubic yard.



1 GEORGE V., A. 1911

Progress of dredging operations at date of writing, the close of the season, 1908.

Locality.	Distance English miles.	Total length requiring dredging.	Length dredged in 1909.	Total length of 30 foot channel dredged.	Length yet to be dredged.
		Miles.	Miles.	Miles.	Miles.
Division 1 :— Montreal to Sorel.....	45	22·90	.....	22·90	All completed.
Division 2 :— Sorel to Batiscan.....	36	12·45	.....	12 45	All completed.
Division 3 :— Lake St. Peter.....	20	18·00	4·98	*0·40 †17·60	All completed. 0·40 to be widened.
Division 4 :— Batiscan to Quebec.....	59	10 00	0·90	6·15	3·85
Division 5 :— Quebec to The Traverse.....	60	6·65	1·00	3·00	3·65
Total.....	220	70·00	6·88	62·50	7·50

\* Not widened.      † Widened.

PROGRESS of the Dredging Operations at the date of writing, the close of the season of 1909.

LOCALITY.	LENGTH OF DREDGING.		Cubic yards yet required to be done.
	Required.	Done.	
	Miles.	Miles.	
Division 1 :— Longueuil Shoal.....	.....	1·10	.....
Longue Pte. to Pte. aux Trembles (E. H.) .....	.....	5·05	.....
Ile Ste. Thérèse.....	.....	0·40	.....
Varennnes to Cap. St. Michel.....	.....	3·00	.....
Cap. St. Michel to Vercheres.....	.....	4·50	.....
Vercheres Traverse.....	.....	1·10	.....
Vercheres to Contrecoeur.....	.....	1·70	.....
Contrecoeur Channel.....	.....	6·05	.....
Total.....	.....	22·90	.....
Division 2 :— Sorel to Ile de Grace.....	.....	4·40	.....
Stone Island.....	.....	1·10	.....
Ile aux Raisins.....	.....	0·25	.....
Lake St. Peter (see Div. 3).....	.....	.....	.....
Port St. Francis .....	.....	0·50	.....
Three Rivers.....	.....	0·50	.....
Cap. Madeleine to Bécancour. ....	.....	1·55	.....
Bécancour to Champlain.....	.....	2·25	.....
Champlain to Pte. Citrouille.....	.....	1·30	.....
Batture Perron.....	.....	0·60	.....
Total.....	.....	12·45	.....



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PROGRESS of the Dredging Operations at the date of writing, the close of  
the season of 1909—*Concluded.*

LOCALITY.	LENGTH OF DREDGING.		Cubic yards yet required to be done.
	Required.	Done.	
	Miles.	Miles.	
Division 3:—			
Lake St. Peter.....	.....	*0·40 †17·60	500,000
Total.....	.....	18·00	500,000
Division 4:—			
Batiscan to Cap Levrard.....	.....	3·00	.....
Cap à la Roche Channel.....	0·90	1·10	600,000
Poullier Rayer.....	0·40	0·80	225,000
Cap Charles.....	0·55	0·35	200,000
Grondines.....	0·80	.....	300,000
Lotbinière.....	.....	0·40	.....
Cap Santé..	.....	0·20	.....
Ste. Croix.....	0·60	0·30	150,000
St. Augustin.....	0·60	.....	300,000
Total ...	3·85	6·15	1,775,000
Division 5:—			
Quebec to the Traverse.....	3·65	3·00	2,000,000
Total.....	3·65	3·00	2,000,000
Totals.....	7·50	62·50	4,275,000
Cubic yards yet to be done.....	.....	.....	4,275,000
Cubic yards done.....	.....	.....	68,121,577
Total .....	.....	.....	72,396,477

\* Not widened.

† Widened.



RIVER ST. LAWRENCE SHIP CHANNEL.  
ABSTRACT of work of Dredging Fleet during the Fiscal Year ended March 31, 1910.

Dredge.	Locality of Dredging.	Time of Service.		Nominal working time, 24 hours per day.		Hours actual dredging.	Number of scows filled.	Number of cubic yards dredged (scoow measurement).	Depth of dredging at low water.		Width in feet.	Character of Soil.	Remarks.
		Days.	Hours.	Hours.	Hours.				Ft.	In.			
<i>Laval</i> (No. 1) .....	Cap Levard Channel.	159	3,492	2,544 $\frac{1}{2}$	1,480	231,100	30	0	450			Hard pan, hard clay and stones.....	Capt. R. Matte.
	Varennes Curve. ....	16	348	245 $\frac{3}{4}$	144	43,200	35	0	500 to 650			Soft clay ....	
		175	3,840	2,790	1,624	274,300							
<i>Laurier</i> (No. 2).....	Varennes Curve.....	39	852	484 $\frac{3}{4}$	263	52,600	35	0	550 to 600			Soft clay.....	Capt. C. Gendron.
	Cap à la Roche Curve.	138	2,674	1,837 $\frac{1}{2}$	522	92,482	30	0	450 to 550			Shale rock and boulders..	
		117	3,526	2,322 $\frac{1}{2}$	785	145,082							
<i>Lady Aberdeen</i> (No. 3) ..	Cap Levard Channel..	25	552	353 $\frac{1}{2}$	263	50,800	30	0	450			Hard clay and stones....	Capt. O. Gaucher.
	Cap Charles Curve...	136	2,988	1,985 $\frac{3}{4}$	549	109,600	30	0	600			Shale rock and boulders.	
	Pointe aux Trembles (E.H.).....	11	240	129	46	9,200	30	0	450			Coarse black sand (cleaning up).....	
<i>Lady Minto</i> (No. 4) .....		172	3,780	2,468	858	169,600							Capt. B. Ladebauche.
	Varennes Curve.....	53	972	710 $\frac{1}{2}$	774	154,800	35	0	550 to 600			Clay and stones.....	
	Cap Charles Channel.	136	2,983	2,146 $\frac{1}{2}$	1,166	233,200	30	0	450			Hard pan, hard clay and stones...	
<i>La Fontaine</i> (No. 5).....		189	3,960	2,856 $\frac{3}{4}$	1,940	388,000							Capt. A. Marcotte.
	Varennes Curve.....	45	996	699 $\frac{1}{2}$	352	105,600	35	0	550 to 600			Soft clay.....	
	Cap à la Roche Curve.	135	2,964	2,184	566	169,800	30	0	450 to 550			Shale rock .....	
		180	3,960	2,883 $\frac{1}{2}$	918	275,400							



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<i>Baldwin</i> (No. 6).....	Cap Levrard Channel..	100	2,196	1,466½	650	192,900½	30	0	450	Hard pan, clay and stones	Capt. L. Dauphinais.
	Champlain Channel. . .	58	1,272	978½	860	225,000	30	0	450	Sand (cleaning up) . . . . .	
	St. Anne Traverse . . .	17	384	238½	231	69,300	35	0	450	Soft clay . . . . .	
		175	3,852	2,683½	1,741	487,200					
<i>J. Israel Tarte</i> (No. 7)...	No. 3 Curve to White Buoy (Lake St. Peter)	172	3,780	2,594½	... . . . .	2,914,139	30	0	450	Soft blue clay, some stones	Capt. J. S. Michaud.
<i>Beaujeu</i> (No. 8).....	St. Thomas Channel . . Beaujeu Channel.....	132	1,852	1,214½	410	779,100	30	0	1,000	Clay and stones.....	Capt. A. Bourget.....
		26	314	185	59	104,000	30	0	1,000	Sand, some soft blue clay and stones.....	
		158	2,166	1,399½	469	883,100					
<i>Galreston</i> (No. 9).....	Beaujeu Channel.....	145	1,999	1,449½	485½	730,000	30	0	1,000	Sand, gravel, clay and stones.....	Capt. L. Lemieux.....
		.....	.....	.....	.....	6,266,821					







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[illegible]



## RIVER ST. LAWRENCE SHIP CHANNEL—Continued.

[illegible]

### DETAILS of Dredging, Locality and Cost per Cubic Yard.

Dredges.	Total cost of operation of each dredge and plant during Fiscal Year.	Number of days in operation each dredge.	Cost per day, operations of dredges and plant.	Days working each locality.	Cost of work, each locality.	Total cost of operations of each dredge.	Number of cubic yards dredged in each locality.	Total cubic yards for each dredge.	Cost per cubic yard, each locality.	Average cost per cubic yard for each dredge.	Kind of material dredged.	Locality of dredging.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.			Cts.	Cts.		
Laral (No. 1).....	48,240 78	175 275 66	159	43,830 18	231,100	48,240 78	231,100	274,300	18 96 100	17 53 100	Hard pan, hard clay and stones..... Soft clay.....	Cap Levrard Channel. Varennes Curve.
Laurier (No. 2)....	48,375 33	177 273 30	39 138	10,658 98 37,716 35	52,600 92,482	48,375 33	52,600 92,482	145,082	20 26 100 40 16 8	33 34 100	Soft clay..... Shale rock and boulders..	Varennes Curve. Cap à la Roche Curve.



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<i>Lady Aberdeen</i> (No. 3).	51,060 23	172 296 86	25 136 11	7,421 55 40,373 20 3,265 48	51,060 23	50,800 109,600 9,200	14 36 35 169,600	14 36 35 169,600	Hard clay and stones. Shale rock and boulders, Coarse black sand (clean- ing up).	Cap Levrard Channel. Cap Charles Curve. Pte. aux Trembles (E.H.)
<i>Lady Minto</i> (No. 4) . . .	52,246 22	189 276 43	53 136	14,651 06 37,595 16	52,246 22	154,800 233,200	9 16 16 388,000	9 16 16 388,000	Clay and stones. Hard pan, hard clay and stones.	Varennnes Curve. Cap Charles Channel.
<i>Lafontaine</i> (No. 5) . . . .	56,198 52	180 312 21	45 135	14,049 63 42,148 89	56,198 52	105,600 169,800	13 24 275,400	13 24 275,400	Soft clay. Shale rock.	Varennnes Curve. Cap à la Roche Curve.
<i>Baldwin</i> (No. 6) . . . . .	50,761 50	175 290 06	100 58 17	29,006 57 16,823 81 4,931 12	50,761 50	192,900 225,000 69,300	15 7 7 487,200	15 7 7 487,200	Hard pan, clay and stones Sand (cleaning up). Soft clay.	Cap Levrard Channel. Champlain Channel. Ste. Anne Traverse.
<i>J. Israel Tarte</i> (No. 7).	113,719 31	172 661 16	172	113,719 31	113,719 31	2,914,139	3 3 2,914,139	3 3 2,914,139	Soft blue clay, some stones.	Lake St. Peter.
<i>Beaujeu</i> (No. 8) . . . . .	51,306 41	158 324 72	132 26	42,863 58 8,442 83	51,306 41	779,100 104,000	5 8 883,100	5 8 883,100	Clay and stones. Sand, soft blue clay and stones.	St. Thomas Channel. Beaujeu Channel.
<i>Galveston</i> (No. 9) . . .	55,360 47	145 381 79	145	55,360 47	55,360 47	730,000	7 7 730,000	7 7 730,000	Sand, gravel, clay and stones.	Beaujeu Channel.
Montreal Harbour (ship channel) — Drilling and blasting, Sec. 12, 13 . . . . . Removal loose rock, Sec. 12, 13 . . . . . Dredging, Sec. 36, 42..	527,268 77	1,543	1,543	13,386 51 16,130 40 16,105 03	572,950 71	11,261 26,000 61,464	1 62 26 87,464	1 62 26 87,464	Rock. Rock. Hard pan.	Montreal Harbour. " "
						6,354,285	6,354,285	6,354,285		



## DREDGING PLANT.

The following is a description of the dredging plant at the end of the season of 1909 owned and operated by the Department of Marine and Fisheries in connection with the River St. Lawrence ship channel:—

## DREDGES.

*The Elevator Dredge 'Laval' (No. 1), wooden hull.—*

Length over all, 150 feet.

Breadth of beam, 30 feet.

Depth of hold, 14 feet.

Average draught, 11 feet.

Greatest working depth, 42 feet.

Hull built in Ottawa in 1894.

Steel buckets.

Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

*The Elevator Dredge 'Laurier' (No. 2), wooden hull.—*

Length over all, 163 feet.

Breadth of beam, 32 feet.

Depth of hold, 14 feet.

Average draught, 10 feet.

Greatest working depth, 45 feet.

Built at Sorel shipyard in 1897.

Steel buckets.

Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

*The Elevator Dredge 'Lady Aberdeen' (No. 3), steel hull.—*

Length over all, 148 feet.

Breadth of beam, 32 feet.

Depth of hold, 13 feet.

Average draught, 8.5 feet.

Greatest working depth, 42.5 feet.

Built at Sorel shipyard in 1900.

Steel buckets.

Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

*The Elevator Dredge 'Lady Minto' (No. 4), steel hull.—*

Length over all, 148 feet.

Breadth of beam, 32 feet.

Depth of hold, 13 feet.

Average draught, 8.5 feet.

Greatest working depth, 42.5 feet.

Built at Sorel shipyard in 1900.

Steel buckets.

Working capacity per day in hard material, 1,000 to 2,000 cubic yards.



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*The Elevator Dredge 'Lafontaine' (No. 5), wooden hull.—*

Length over all, 168 feet.

Breadth of beam, 32 feet.

Depth of hold, 14 feet.

Average draught, 9 feet.

Greatest working depth, 45 feet.

Built at Sorel shipyard in 1901.

Steel buckets.

Working capacity per day in hard material, 1,000 to 2,000 cubic yards.

*The Elevator Dredge 'Baldwin' (No. 6), wooden hull.—*

Length over all, 165 feet.

Breadth of beam, 34 feet.

Depth of hold, 14 feet.

Average draught, 8 feet.

Greatest working depth, 42.5 feet.

Built at Sorel shipyard in 1902.

One cubic yard buckets strengthened for fairly hard material.

Working capacity per day in medium material, 2,500 to 3,500 cubic yards.

*The Hydraulic Dredge 'J. Israel Tarte' (No. 7), steel hull.—*

Length over all, 160 feet.

Breadth of beam, 42 feet.

Depth of hold, 12.5 feet.

Average draught, 6 feet.

Length of suction frame, 80 feet.

Greatest working depth, 47 feet.

Built at the Polson Iron Works, Toronto, in 1902.

Working capacity per day in soft material, 12,000 to 20,000 cubic yards.

*Discharge Pipe and pontoons of Dredge 'J. Israel Tarte' (No. 7).—*

Twenty-three lengths of pipe 36 inches diameter by 100 feet long

One length of pipe 36 inches diameter by 35 feet long.

Twenty-three pairs of pontoons for floating pipes, 42 inches diameter by 90 feet long.

*Winch Scow 'No. 3' for Dredge 'J. Israel Tarte' (wooden hull).—*

Length over all, 60 feet.

Breadth of beam, 18 feet.

Depth of hold, 6 feet.

Built at Sorel shipyard in 1902.

*Winch Scow (wooden hull) for Dredge 'J. Israel Tarte' (with steam boiler and steam winch).—*

Length over all, 63 feet.

Breadth of beam, 27 feet.

Depth of hold, 8 feet.

Built at Sorel shipyard in 1909.

*The Suction Hopper Dredge 'Galveston' (No. 9), steel hull, twin-screw.—*

Length over all, 233 feet.

Breadth of beam, 39 feet.

Depth of hold, 15 feet 5 inches.

Draught when loaded with 1,800 tons, 14 feet 9 inches aft, 13 feet 1 inch forward.



Greatest working depth, 55 feet.

Built in 1904.

Two suction pumps, Dutch type, 8 feet 6 inches outside diameter.

Working capacity, 1,350 cubic yards in 45 minutes.

Hopper capacity, 1,400 cubic yards.

*Sea-going Suction Hopper Dredge 'Beaujeu' (No. 8), steel hull, twin-screw.—*

Length between perpendiculars, 264 feet.

Breadth of beam, 45 feet.

Depth of hull, 20 feet.

Capacity of hoppers, 2,000 cubic yards in 45 minutes.

Greatest working depth, 65 feet.

Draught when loaded, 15 feet.

Ordinary speed, 9 statute miles.

Built at Sorel shipyard in 1907.

#### TUGS.

*The Ice-breaking and Sweeping Tug 'Lady Grey' (steel hull, twin-screw).—*

Length between perpendiculars, 172 feet.

Length over all, 183 feet 6 inches.

Breadth, moulded, 32 feet.

Breadth, extreme, 32 feet 3 inches.

Depth, moulded, 18 feet.

Draught, mean to bottom of flat plate keel (normal), 12 feet.

Draught when ice-breaking, about 13 feet.

Displacement in tons at 12-foot draught, 1,070.

Mean speed at 12-foot draught on six runs over measured mile base, 14 knots.

Built by Vickers Sons & Maxim, Limited, Barrow-in-Furness, in 1906.

*The Tug 'Frontenac' (composite hull).—*

Length over all, 113 feet.

Breadth of beam, 23 feet.

Depth of hold, 10 feet.

Average draught, 9 feet.

Built at Sorel shipyard in 1902.

*The Tug 'De Lévis' (wooden hull).—*

Length over all, 104 feet.

Breadth of beam, 20 feet.

Depth of hold, 10 feet.

Average draught, 8 feet.

Built at Sorel shipyard in 1902.

*The Tug 'James Howden' (wooden hull).—*

Length over all, 100 feet.

Breadth of beam, 21 feet.

Depth of hold, 10 feet.

Average draught, 7.5 feet.

Built at Sorel shipyard in 1903.

*The Tug 'St. Jean Iberville' (steel hull).—*

Length over all, 90 feet.

Breadth of beam, 18 feet.

Depth of hold, 12 feet.

Average draught, 10 feet.

Built at Sorel shipyard in 1897.



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*The Tug 'Lac St. Pierre' (wooden hull).—*

Length over all, 100 feet.  
Breadth of beam, 21 feet.  
Depth of hold, 10 feet.  
Average draught, 7.6 feet.  
Built at Sorel shipyard in 1901.

*The Tug 'Portneuf' (wooden hull).—*

Length over all, 85 feet.  
Breadth of beam, 17 feet 3 inches.  
Depth of hold, 9 feet 9 inches.  
Average draught, 8 feet.  
Built in 1905.

*The Tug 'Cartier' (wooden hull).—*

Length over all, 84 feet.  
Breadth of beam, 18 feet.  
Depth of hold, 9.5 feet.  
Average draught, 8 feet.  
Built at Sorel shipyard in 1893.

*The Tug 'Emilia' (wooden hull).—*

Length over all, 84 feet.  
Breadth of beam, 17 feet.  
Depth of hold, 9 feet.  
Average draught, 8 feet.  
Built at Sorel shipyard in 1898.

*The Tug 'Champlain' (wooden hull).—*

Length over all, 84 feet.  
Breadth of beam, 17 feet.  
Depth of hold, 9 feet.  
Average draught, 8 feet.  
Built at Sorel shipyard in 1901.

*The Tug 'Jessie Hume' (wooden hull).—*

Length over all, 72 feet.  
Breadth of beam, 17.2 feet.  
Depth of hold, 10 feet.  
Average draught, 8.5 feet.  
Built at Buffalo in 1878.

*The Tug 'Montcalm' (wooden hull).—*

Length over all, 80 feet.  
Breadth of beam, 23 feet.  
Depth of hold, 8 feet.  
Average draught, 7 feet.  
Built at Sorel shipyard in 1903.

*The Tug 'Carmelia' (wooden hull).—*

Length over all, 84 feet.  
Breadth of beam, 17 feet.  
Depth of hold, 9 feet.  
Average draught, 8 feet.  
Purchased in 1903.



## COAL BARGES.

*Coal Barge 'No. 1' (wooden hull).—*

Length over all, 120 feet.  
Breadth of beam, 24 feet.  
Depth of hold, 10 feet.  
Built in Sorel shipyard in 1898.

*Coal Barge 'No. 2' (wooden hull).—*

Length over all, 125 feet.  
Breadth of beam, 25 feet.  
Depth of hold, 11 feet.  
Built at Sorel shipyard in 1900.

*Coal Barge 'No. 3' (wooden hull).—*

Length over all, 98 feet.  
Breadth of beam, 28 feet.  
Depth of hold, 12 feet.  
Built at Sorel shipyard in 1902.

*Coal Barge 'No. 4' (wooden hull).—*

Length over all, 98 feet.  
Breadth of beam, 28 feet.  
Depth of hold, 12 feet.  
Built at Sorel shipyard in 1903.

*Stone-lifter 'No. 2' (wooden hull).—*

Length over all, 80 feet.  
Breadth of beam, 25 feet.  
Depth of hold, 9.8 feet.  
Rebuilt at Sorel shipyard in 1897.

*Stone-lifter 'No. 3' (wooden hull).—*

Length over all, 108 feet.  
Breadth of beam, 34 feet.  
Depth of hold, 14 feet.  
Built at Sorel shipyard in 1903.

*Sounding Scow 'No. 1' (wooden hull).—*

Length over all, 60 feet.  
Breadth of beam, 25 feet.  
Depth of hold, 6 feet.  
Built at Sorel shipyard in 1898.

*Sounding Scow 'No. 2' (wooden hull).—*

Length over all, 75 feet.  
Breadth of beam, 38 feet.  
Depth of hold, 5 feet.  
Transferred from Prescott agency in 1909; remodelled and improved.

*Floating Shop (wooden hull).—*

Length over all, 90 feet 4 inches.  
Breadth of beam, 25 feet.  
Depth of hull, 9 feet.  
One forge, 1 scraper, 1 emery wheel, 1 drill, 1 lathe, 1 6-h.p. Foss gasoline engine.  
Living quarters for four.  
Built at Sorel shipyard in 1908.



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*Two Boarding Scows (wooden hulls).—*

Length over all, 60 feet.  
Breadth of beam, 18 feet.  
Depth of hull, 7 feet.  
Built at Sorel shipyard in 1908.

*One Boarding Scow (wooden hull).—*

Length over all, 75 feet.  
Breadth of beam, 25 feet.  
Depth of hold, 5.5 feet.  
Built at Sorel shipyard in 1902.

*Two Hopper Scows (wooden hulls), with hydraulic power for closing gates.—*

Length over all, 97 feet.  
Breadth of beam, 24.5 feet.  
Depth of hold, 9 feet.  
Capacity, 200 cubic yards.  
Built at Sorel shipyard in 1897.

*Two Hopper Scows (wooden hulls) with hydraulic power for closing gates.—*

Length over all, 90 feet.  
Breadth of beam, 18 feet.  
Depth of hold, 7 feet.  
Capacity, 150 cubic yards.  
Built at Sorel shipyard in 1898.

*Four Hopper Scows (wooden hulls), with hydraulic power for closing gates.—*

Length over all, 97 feet.  
Breadth of beam, 24 feet.  
Depth of hold, 9 feet.  
Capacity, 200 cubic yards.  
Built at Sorel shipyard in 1899 and 1901.

*Five Hopper Scows (wooden hulls), with hydraulic power for closing gates.—*

Length over all, 98 feet.  
Breadth of beam, 24 feet.  
Depth of hold, 9.5 feet.  
Capacity, 300 cubic yards.  
Built at Sorel shipyard, two in 1901, three in 1902.

*Two Hopper Scows (wooden hulls), with hydraulic power for closing gates.—*

Length over all, 97 feet.  
Breadth of beam, 24.5 feet.  
Depth of hold, 9 feet.  
Capacity, 300 cubic yards.  
Built at Sorel shipyard in 1903.

*Two Hopper Scows (wooden hulls), with hydraulic power for closing gates.—*

Length over all, 93 feet.  
Breadth of beam, 24.5 feet.  
Depth of hold, 8 feet.  
Capacity, 250 cubic yards.  
Built at Sorel shipyard in 1909.

*Two Small Flat Scows (wooden hulls), used at the Sorel Shipyard.—*

Twenty feet by 40 feet.  
One of these with a derrick of 5 tons lifting capacity.



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## APPENDIX No. 4.

## SOREL SHIPYARD.

SOREL, June 27, 1910.

G. J. DESBARATS,  
Deputy Minister, Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the following report on work performed at the Sorel shipyard, during the twelve months, from April 1, 1909, to March 31, 1910.

At the beginning of the fiscal year, the whole of the ship channel fleet was at Sorel, completing repairs and getting ready for the season's operations.

There were nine dredges, with their nine tugs and complement of scows, coal barges, stone lifters, floating shop, &c., also the inspection boats, three in number.

Besides the vessels, we had here at the shipyard, *La Canadienne*, of the Hydrographic Survey, the *Lady Grey*, the *Maisonneuve*, the dredge *International*, of the Public Works Department, the vessels of the construction of lights branch: *Vercheres*, *Hosanna*, *Alpha*, and several scows. The *Shamrock* and *Acetylene* were also being repaired at the yard, as well as the *Constance*.

## SPRING REPAIRS.

The work performed on these vessels was described in the report for the last fiscal year, and was in most cases completed only after the opening of the new one.

The *Richelieu* opened on April 5, and the *St. Lawrence* on the 18th. The first dredge to leave the shipyard was the No. 7, on April 28. The others followed in rapid succession.

## CONSTRUCTION.

Work was continued on lighthouse tender No. 21. The vessel was launched with marked success, on September 4. The name of *Montmagny* was chosen for the new craft.

*Dredge No. 19* was brought almost to completion, in September, 1909, and with the aid of the floating crane of the Montreal Harbour Commission we tried to place on board the three spuds. After placing them, it was ascertained that the buoyancy of the vessel was not proportionate to the great weight and leverage of these anchors. The vessel was hauled in November, 1909, in order to lengthen the hull, and thereby compensate the lack of displacement.

*Construction No. 29*.—The hull of this tug was ready for launching in September, 1909. Since then, the boiler and machinery were installed on board, the woodwork almost completed, and, at the end of fiscal year, we could count on the vessel being ready to go in commission in month of June.

## MATERIAL FOR FUTURE WORK.

During 1909, material was ordered for the following: One elevator dredge, one sand scow with conical valves, one coal barge.

This material was received partly during winter of 1910.





MAINE HISTORICAL SOCIETY  
Plan of River Falls  
SCALE 1/4" = 1 MILE







## SESSIONAL PAPER No. 21

*Construction No. 20* is a stone lifter scow. This was laid in 1909, and at the end of March, 1910, was sufficiently advanced to guarantee launching at high water in May.

*Construction No. 24*, a dipper dredge, was begun in 1909-10, and the work of assembling begun in 1910.

## SUMMER WORK, 1909.

The vessels of the dredging fleet were kept in efficient working order throughout the season of navigation.

## MAINTENANCE AND IMPROVEMENTS TO SHIPYARD BUILDINGS AND PLANT.

All buildings were kept in repair; the roofs of the several shops were painted; the yard fence received a coat of lime. The narrow gauge railway was kept in working order; a crane installed over the standard gauge track in the yard. This crane has a capacity of 30 tons, and is equipped with an auxiliary block and trolley for quickly discharging lighter weights.

One new building was erected to house the bending rolls, purchased the previous year. They are located in an extension to the boiler shop. The traveller already working at the south end of the shop was altered, and its track extended through the extension, so that plates may be handled at the rolls, and brought where the boilers are assembled, in the main shop. The foundations for the rolls are of concrete with piles driven 12 feet down. The foundations of the walls and pillars are done in the same way.

A new storeroom (building No. 24) was built for housing all new machinery, either made at the shop or purchased elsewhere, until each machine can be installed or shipped to destination.

The building is 60 feet long by 36 feet wide, and has two floors. Piles had to be driven for foundation, on account of the heavy weight to be borne.

*Building No. 3* (pipe fitting shop).—One cast-iron floor for bending purposes was prepared. A platform and shed was built, to carry and shelter the same.

*Building No. 4*.—There were alterations to offices, so as to provide two more rooms. The ground floor foundation of storeroom had to be repaired.

*Building No. 6* (blacksmith shop).—A 10-foot extension to farriers' shop was built.

*Saw Mill*.—One 60-inch circular saw was added to the equipment; also one saw sharpening machine and one exhaust fan.

## A BRIEF SUMMARY OF THE PRINCIPAL REPAIRS EFFECTED DURING THE YEAR FOLLOWS.

*Acetylene*.—In the spring of 1909 the rebuilding and equipping of the barge was completed, and during the working season painting and ordinary repairs were made. The vessel was hauled on July 2, to change the sea-cock. During winter 1910, there was a remodelling of one room and overhauling generally.

*Adelard*.—This scow was caulked, painted and had general repairs.

*Alpha*.—The *Alpha* was hauled twice during the summer to place new propeller, and once, before winter of 1910. The hull was caulked early in the spring. The vessel is not in commission this season.

*Barges*.—*Coal Barge No. 1* had repairs to deck, caulking and painting.

*Coal Barge No. 2* had new guard and was painted.

*Coal Barge No. 3*.—Guard rail was repaired. The deck over the forecastle was caulked, and the hull, as well as the rudder tube, was repaired.

*Coal Barge No. 4* was supplied with a new whistle and one pair of davits; deck was repaired and vessel painted.



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*Barge 'Beauport,'* of Public Works Department.—This barge was hauled on the ways; her hull repaired and caulked; rigging of mast was strengthened, and two coats of paint were given the vessel.

*'Bronx' and 'Buffalo,'* two gasoline launches, were kept in good working order during the summer. They were hauled out for the winter and placed under a shed, to undergo repairs.

*Tug 'Carmelia'* was hauled out twice: first in the summer of 1909, for caulking, and again in November, 1909. The vessel wintered on the ways, in order to strengthen the shaft and renew the stern tube.

There were also repairs to the pistons, valves and the guards. The boilers were caulked and repaired.

*Tug 'Cartier'* was hauled for repairs to stern tube, June 1, 1909, also on September 14 to repair keel, rudder and steering sheaves. The boiler was repaired and had 35 new tubes inserted.

*Tug 'Champlain.'*—In winter of 1910, the deck houses were altered; the galley was placed on deck, and four rooms below. There were repairs to boiler; the stay rods were caulked. The controlling engine was renewed and a new steam steering gear was installed. The boiler was cleaned and overhauled during winter of 1910. Foundations for same were renewed, connections refitted and the vessel painted.

*Tug 'Daisy,'* of the Public Works, had a new set of grates, July 16, 1909.

*Barge 'Davis.'*—In April, 1909, mast was strengthened with steel sleeve. In summer, a new safety valve was supplied and connected. In winter, 1910, there were repairs to the stove, the steam piping, the winches, and the machinery in general. The deck was made water-tight with oakum and marine glue; a few planks were renewed.

*De Lévis.*—Repairs to machinery. The boiler was lifted and overhauled; the heating system and electric plant were put in order, and the vessel was painted.

*Dredge No. 1.*—Summer, 1909, light ordinary repairs. Winter: repairs to buckets, chute plates; machinery was overhauled, winches also. A new upper tumbler was put in place. Two of the boilers were lifted for inspection and cleaning; a funnel for main boiler placed.

*Dredge No. 2.*—Had a new 24-barrel raft. During winter, 1910, general repairs to buckets, chute, electric plant, machinery and boilers. The 'A' frame and bow crane were strengthened. The ladder frame was overhauled and braced.

*Dredge No. 3.*—Winter, 1910: ordinary repairs to woodwork; a few new boiler tubes inserted; a new lower tumbler was placed, and the ladder frame had to be unshipped for repairs to bearing.

*Dredge No. 4.*—Repairs to buckets: a new upper tumbler and a new lower tumbler were fitted and installed. One of the boilers was lifted for repairs and cleaning.

*Dredge No. 5.*—A new bracket at lower end of bucket ladder frame. Winter of 1910: a new upper tumbler was placed; machinery was overhauled; the deck and hull were caulked. The bucket and frame was unshipped for repairs to bearings.

*Dredge No. 6.*—1909: ordinary repairs. Winter, 1910: lower tumbler was renewed. The boilers were raised to allow inspection and cleaning. New safety valves were put in place. There was a general overhauling of the electric plant and machinery.

*Dredge No. 7.*—In summer of 1909 a 24-barrel raft was built and supplied.

Four lengths, 100 feet each, of pontoons, were begun in 1909, and completed during winter, to be added to the discharge pipe of this dredge.

The 22 existing pontoons were all hauled out at end of November. They were all tested, leaks were stopped, woodwork repaired, and the 22 were painted and put in good order.

The runner of the turbine pipe was repaired, and patterns for a new one were made, and casting ordered; this will serve as spare.



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The inlet elbow of suction pipe was altered, in view of dredging to greater depth. This will allow lowering the pipe and cutter head to a more open angle.

The boilers were repaired. One set of jet blowers was installed, making three boilers now equipped with this device. It is very effective in keeping the flues clean.

The two firehold floors, in front of the boilers, which were of brick and cement, have been replaced by panels of chequered plate, with air space underneath. These new floors will make the plating and keelsons accessible for cleaning and repainting when needed.

One new lifeboat was installed on board, together with suitable davits.

*Dredge No. 8.*—A new and powerful windlass was installed in April, 1909. During summer, the dredge had the ordinary repairs. During winter of 1910, repairs were made to the gate valve of the suction pipe. A casting was placed and made in two halves for facility of adjusting.

The stern tube was supplied with two lignum vitæ bushes. There were also installed new cranes and two pairs of davits were altered.

*Dredge No. 9.*—This dredge was put into dry dock at Lévis. While there, the hull was scraped and overhauled. Guides for the suction pipe were straightened and braced.

Four new hopper doors were prepared in Sorel, as well as additional hinges, and while the vessel was in the dock they were fitted on board, in place of as many broken ones. During winter of 1910, two masts were renewed, and there were heavy repairs to the boiler. Four new side lights were added near the bow of the boat.

The hull plating was painted on the inside, after thorough scraping. A coat of cement was applied on the bilges. The outside of the hull remained to be painted in April, 1910.

This scraping and painting was of vital importance for the preservation of the hull and frames.

*Tug 'Emilia'* was hauled out in summer of 1909, for repairs to rudder. The hull was caulked at the same time, and painted. The vessel was hauled out again in November, to ship a new propeller wheel, and for repairs to her keel, which had been split by the vessel grounding on shoals.

In winter of 1910, some alterations to the woodwork were made. The galley was placed on deck, and rooms installed below. This to allow the double crew to be lodged on board the vessel, and doing away with a lodging scow.

The boiler of tug *Emilia* was raised for inspection and cleaning.

*Falken*, an ex-whaler, was transformed into a lightship for Lake Erie, to be known as 'South End Shoal No. 18.'

The vessel had good triple expansion engines. A deck house was built to serve as a living room for the keepers of the lightship, besides giving space for a lamp room. Suitable anchors, chains, lifeboats, lanterns, signal ball, submarine bell, &c., were supplied and installed on board.

The hull was thoroughly scraped and painted inside and outside. The operations were only completed in May, 1910.

*Fielding.*—Three complete steel buckets were ordered to be cast and were fitted at Sorel for dredge *Fielding*, of Public Works Department, according to plans in the possession of the shipyard, since the building of this dredge.

*Floating Shop.*—The gasoline engine was overhauled and put in working order. A furnace installed on board, for heating purposes, there being no steam boiler on this vessel.

*Floating Crane.*—The floating crane purchased from Messrs. Vickers Sons & Maxim by the Harbour Commissioners of Montreal, was brought first to Sorel, and the erection of the crane was performed here by the representative of the firm, with men loaned from the shipyard. The crane was painted and the inside of the hull received



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a coat of cement. The cost of these operations was reimbursed by the makers of the crane.

*Frontenac* was hauled out for new propellers.

*Tug 'Hosanna,'* of the construction of lights branch, was hauled, May, 1909, to caulk her hull.

On November 26 she was hauled out again for extensive repairs to be effected during winter, 1910. Nearly half of the vessel aft was rebuilt. The engines were made as good as new. The high pressure cylinder and intermediate separator being made new. There were also fitted, new eccentric bands, new rods, new link, stuffing boxes, &c.

The shaft and propeller were removed, and then placed in alignment. The woodwork above deck was also repaired.

*Iberville* was hauled, April, 1909, for repairs to her rudder, and again in August, to renew two broken blades of her propeller, and for repairs to the stern tube.

In winter of 1910, she had the ordinary repairs and painting.

*Tug 'James Howden.'*—Winter of 1910, the deck was caulked and the machinery overhauled. The boiler was raised for cleaning and repairing.

*Tug 'Jessie Hume'* had light repairs during summer. Was hauled, May 28, to repair stern tube and caulk the hull. A new steam windlass with 5-inch pistons by 5-inch stroke, was installed during winter. Boiler tubes were repaired and a new smokestack made and installed. The woodwork was repaired.

*Ice-breaker 'Lady Grey'* was painted for her summer cruise in 1909. The vessel did not winter at Sorel.

*Maintenance of Lights.*—Lightships Nos. 1 and 2, for Lake St. Pierre, were painted; partitions were built between the room for the gas tanks and the keeper's room, and ventilation provided.

*Lightship No. 3* was also fixed in the same manner. In spring of 1910, four beacons for same service were supplied, together with six sentry boxes.

*Maisonneuve*, of the maintenance of lights branch, was hauled, in November, 1909, as well as the scow *Lenore*. The hull and deck of the *Maissoneuve* were repaired, the water tube boiler was completely overhauled, and a new boat, 15 feet 3 inches by 3 feet 9 inches, was built and supplied.

*Tug 'Monitor,'* of Public Works Department, wintered at the yard. Was hauled for repairs to stern tube and shaft; her machinery was repaired.

*Dredge 'Ottawa,'* of Public Works Department, also wintered at shipyard, and had repairs made to her machinery.

*Tug 'Lake St. Pierre'* was hauled, June 12, for repairs to the rudder and to the stern tube. In winter, there were repairs to machinery, woodwork and boilers.

*Dredge 'Ottawa' Scows.*—The two scows of this dredge were hauled out twice each for repairs, in October, 1909, and then in November for the winter.

*Tug 'Montcalm'* was hauled, June 25, 1909, for caulking of hull, and painting.

*Tug 'Montmorency,'* of Public Works Department, was hauled, October 22, 1909, to ship new propeller. Was hauled also for wintering. The wheelhouse was altered and remodelled. One coil of the tubular boiler was renewed.

*Tug 'Ottawa,'* of Public Works Department, had new propeller put on, in summer of 1909.

*Tug 'Portneuf'* had light repairs in summer, 1909. In the following winter, the boiler was lifted for cleaning and inspection.

*Barge 'Sarah'* was caulked and painted, summer of 1909.

*Dumping Scows*, Nos. 1, 15, 7, 10, 2 and 15, were hauled out for repairs to hull and hopper doors and woodwork generally.



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*Flat Scow No. 1* was hauled out on the beach for repairs.

*Derrick Scow No. 22* had new funnel, and was hauled out for winter repairs, December 7, 1909.

*Pontoon Scow No. 24*—for dredge No. 7.—The machinery of the old anchor scow was installed on a new one. A new house was built. On May 4, after a severe storm on Lake St. Pierre, the scow had to be hauled out, and her hull overhauled and caulked. Knees were added to strengthen the framing.

*Steam Barge 'Shamrock'* was hauled, August 6, 1909, for repairs to her shoe, and to ship new propeller. The vessel was painted. During winter, 1910, repairs and reinforcing of stern were done.

*Sounding Scow No. 1* had general overhauling.

*Sounding Scow No. 2*.—A former sounding machine, consisting of two distinct scows, was reconstructed, and the machinery adapted to the new width of boat, which is now 36 feet wide by 75 feet long.

The shaft carries five independent drums worked by clutches, to operate the hanging roller, &c.

A chart room was built, with a bridge in front.

*Signal Service*.—The building for the Sorel station was raised six feet, to obtain a better view of the river. This also affords more storage room below.

The Longue Pointe station was also raised six feet.

The station at Verchères was established by using an old windmill tower, and adapting same to the purposes of the station.

*Spuds*.—Two forward spuds of dredge *Sir Wilfrid*, of Public Works Department, were fitted with racks and extension feet, and kept ready for future shipment.

*Stone Lifters*.—No. 2 and No. 3 had ordinary repairs.

## WINTER WORK, 1910.

At the end of 1909, the entire dredging fleet was back to winter quarters. There were also wintering at Sorel, the dredge *Ottawa* and tug *Monitor*, of the Public Works Department; the yacht *Montmorency*, same department; *Verchères*, *Hosanna*, *Alpha*, and several scows of the construction of lights branch. The *Maisonneuve*, the *Shamrock* and *Acetylene*, of the maintenance of lights branch; the lightships Nos. 1 to 3, and finally, lightship No. 18, for South East shoal on Lake Erie. There was a total of about 70 vessels of all descriptions at the yard, and besides these, the 22 pipe pontoons of suction dredge No. 7.

*General*.—The shipyard buildings and fences were painted and cleaned. The machinery was kept in good order, comprising the compressed air distribution, heating apparatus, electric lighting, waterworks, slipways, shear legs, &c. The telephone exchange was also kept in working order.

The winter roads were made and kept, both in the yard and on the river, along the fleet wintering on the Richelieu. The ice was cut around the vessels as needed.

*Force Employed*.—The force employed during the fiscal year varied from 716 to 940, and averaged 798 for the year.

The financial statement shows the total amount expended at the Sorel shipyard and ship channel to have been \$1,132,423.81.

I have the honour to be, sir,

Your obedient servant,

L. G. PAPINEAU,  
*Director of Shipyard.*







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Department of Public Works (repairs to dredges, tugs, &c).....	31..	13,656 00
Vickers Sons & Maxim, re floating crane.....	31..	1,234 65
Salaries at Ottawa.....	31..	4,216 62
Dominion Government Steamer <i>Lady Grey</i> (services re winter navigation).....	31..	13,416 82
		1,132,423 81

L. G. PAPINEAU,  
Director of Shipyards.

Shipyards, Sorel, March 31, 1910.



APPENDIX No. 5.

STATEMENT of expenditure for fiscal year 1909-10.

Service.	Vote.	Expenditure.	Balance.
	\$ cts.	\$ cts.	\$ cts.
Ocean and river service—			
Dominion steamers and icebreakers . . . . .	635,000 00	493,149 94	141,850 06
Examination of masters and mates. . . . .	11,400 00	6,662 52	4,737 48
Rewards for saving life . . . . .	39,600 00	39,037 76	562 24
Investigations into wrecks. . . . .	12,000 00	7,760 21	4,239 79
Schools of navigation. . . . .	8,000 00	1,828 58	6,171 42
Registration of shipping. . . . .	2,000 00	1,058 07	941 93
Removal of obstructions. . . . .	20,000 00	3,751 37	16,248 63
Tidal service. . . . .	42,500 00	21,093 17	21,406 83
Winter mail service. . . . .	6,000 00	214 88	5,785 12
Cattle inspection. . . . .	4,500 00	4,335 90	164 10
Wrecking plants. . . . .	30,000 00	30,000 00	.....
Unforeseen expenses . . . . .	5,000 00	3,200 88	1,799 12
Naval militia. . . . .	10,000 00	6,741 89	3,258 11
Patrolling northern waters, &c. . . . .	59,000 00	36,942 75	22,057 25
New icebreaking steamer. . . . .	150,000 00	148,143 17	1,856 83
	1,035,000 00	803,921 09	231,078 91
Public Works—chargeable to capital—			
Ship channel. . . . .	800,000 00	720,739 29	79,260 71
Permanent piers in Lake St. Peter, &c. . . . .	120,000 00	87,105 80	32,894 20
Dredging plant, River St. Lawrence. . . . .	250,000 00	204,112 79	45,887 21
Purchase of yard property at Sorel. . . . .	30,000 00	.....	30,000 00
	1,200 00 00	1,011,957 88	188,042 12
Lighthouse and Coast Service—			
Agencies, rents and contingencies. . . . .	33,000 00	32,999 05	1 95
Salaries and allowances to lightkeepers. . . . .	370,000 00	324,416 14	45,583 86
John Kelly's salary from time of suspension to reinstatement. . . . .	233 33	233 33	.....
Services of R. Rivers, keeping light at Miscou, N.B., in 1899. . . . .	100 00	100 00	.....
Maintenance and repairs to lighthouses. . . . .	730,000 00	704,049 60	25,950 40
Services of M. Barrett, lifting buoys, 1908-09 & 1909-10. . . . .	750 00	750 00	.....
Construction of lighthouses, apparatus, &c. . . . .	800,000 00	737,569 90	62,430 10
J. L. Richard's salary from time of suspension to reinstatement. . . . .	214 41	189 42	24 99
West coast trail, Vancouver Island. . . . .	25,000 00	24,661 46	338 54
Charter of steamer, Lime Kiln Crossing. . . . .	10,000 00	4,245 50	5,754 50
Wireless telegraphic stations. . . . .	129,000 00	116,477 87	12,522 13
Signal Service . . . . .	10,500 00	9,018 60	1,481 40
Administration of pilotage. . . . .	30,000 00	29,998 83	1 17
Maintenance and repairs to wharfs . . . . .	3,000 00	2,387 57	612 43
Maintenance and upkeep of dockyards. . . . .	50,000 00	47,738 92	2,261 08
Breaking ice in Lake Superior, &c. . . . .	40,000 00	33,468 00	6,532 00
Salaries of temporary clerks, &c. . . . .	3,000 00	52 75	2,947 25
Pension to retired pilots. . . . .	4,800 00	3,653 89	1,146 11
" to pilot F. X. Delisle. . . . .	75 00	75 00	.....
Telephonic and reporting stations between Montreal and Quebec . . . . .	23,500 00	22,180 12	1,319 88
New steamer for the great lakes. . . . .	25,000 00	18,531 28	6,468 72
Repairs to maritime road, Gaspé. . . . .	2,000 00	903 67	1,096 33
Purchase of land at St. John, N.B. . . . .	50,000 00	.....	50,000 00
New lightship at Point Pelee, Ont. . . . .	30,000 00	12,243 71	17,756 29
Settlement of Mrs. A. G. Clarke's claim for death of her son. . . . .	2,000 00	2,000 00	.....
	2,372,172 74	2,127,943 61	244,229 13
Civil government salaries. . . . .	236,390 00	220,611 23	15,778 77
Contingencies. . . . .	27,000 00	26,633 36	366 64



## SESSIONAL PAPER No. 21

STATEMENT of expenditure for the year 1909-10—*Concluded.*

Service.	Vote.	Expenditure.	Balance.
	\$ cts.	\$ cts.	\$ cts.
Scientific institutions and hydrographic surveys—			
Meteorological Service.....	127,300 00	121,657 10	5,642 90
Magnetic observatory.....	3,200 00	1,674 79	1,525 21
Montreal observatory.....	500 00	500 00	.....
Kingston observatory.....	500 00	500 00	.....
Hydrographic surveys.....	170,000 00	120,239 77	49,760 23
Hydrographic survey steamer to replace <i>La Canadienne</i> .....	150,000 00	149,999 99	01
	451,500 00	394,571 65	56,928 35
Marine hospitals—			
Care of sick seamen and repairs to hospitals..	70,000 00	63,709 16	6,290 84
Shipwrecked and distressed seamen. .	3,000 00	2,640 10	359 90
	73,000 00	66,349 26	6,650 74
Steamboat inspection.....	53,300 00	40,782 77	12,517 23
Fisheries—			
Salaries and disbursements of Fishery officers....	195,780 00	173,271 52	22,508 48
Services of K. W. McKenzie as special guardian...	125 00	125 00	.....
Fish breeding.....	322,300 00	180,345 65	141,954 35
Services of W. S. Young in 1908.....	100 00	100 00	.....
Services of W. S. Young in 1909.....	100 00	100 00	.....
Fisheries protection service.....	304,200 00	295,443 47	8,756 53
Oyster culture.....	6,000 00	4,234 48	1,765 52
Cold storage.....	40,000 00	14,504 98	25,495 02
Dog fish reduction works.....	50,000 00	33,593 20	16,406 80
Souris fish curing establishments . .	12,000 00	} 724 74	13,004 12
Proceeds of sale reverting to vote.....	1,728 86		
Canadian Fisheries exhibits.....	16,000 00	3,228 51	12,771 49
Distributing of fishing bounty.....	5,600 00	5,045 56	554 44
Building fishways.....	10,000 00	3,992 25	6,007 75
Legal and incidental expenses.....	4,000 00	1,412 28	2,587 72
Georgian Bay laboratory.....	1,500 00	1,426 87	73 13
F. P. S. Cruiser for Pacific Coast. ....	220,500 00	218,585 60	1,914 40
Marine biological stations.....	15,000 00	12,959 92	2,040 08
Transportation of fresh fish.....	45,000 00	38,263 16	6,736 84
Fishery commissions..	15,000 00	6,733 74	8,266 26
International Fishery commission.....	10,000 00	1,094 67	8,905 33
Expenses, inquiries into Prov'l rights <i>re</i> fisheries. ....	10,000 00	.....	10,000 00
Services of customs officers issuing licenses to United States Fishing vessels .....	700 00	528 22	171 78
Services of officers <i>re</i> Fisheries Intelligence bureau.....	500 00	370 26	129 74
	1,286,133 86	996,084 08	290,049 78
Recapitulation—			
Ocean and river service.....	1,035,000 00	803,921 09	231,078 91
Public works chargeable to capital .....	1,200,000 00	1,011,957 88	188,042 12
Lighthouse and coast service .....	2,372,172 74	2,127,943 61	244,229 13
Scientific institutions and hydrographic surveys.....	451,500 00	394,571 65	56,928 35
Marine hospitals.....	73,000 00	66,349 26	6,650 74
Steamboat inspection.....	53,300 00	40,782 77	12,517 23
Fisheries....	1,286,133 86	996,084 08	290,049 78
Civil government salaries .....	236,390 00	220,611 23	15,778 77
Contingencies.....	27,000 00	26,633 36	366 64
	6,734,496 60	5,688,854 93	1,045,641 67



APPENDIX No. 6.

STATEMENT of revenue of Marine and Fisheries Department for fiscal year ended March 31, 1910.

Service.	Amount.	Refunds.	Total.
	\$ cts.	\$ cts.	\$ cts.
Harbours, piers and wharfs....	20,525 04	484 00	20,041 04
Dominion steamers—			
<i>Champlain.</i>			
Freight, \$1,076.76 ; passengers, \$5,133.62 ; meals, \$91.40 ; berths extra. ....	6,301 78		
<i>Minto.</i>			
Freight, \$4,937.57 ; passengers, \$3,163.50 ; meals, \$85.50 ; berths, \$414.00 ; extra, \$7.70. ....	8,608 27		
<i>Earl Grey.</i>			
Freight, \$6,044.74 ; passengers, \$3,043.00 ; meals, \$95.30 ; berths, \$711.00. ....	9,894 04		
<i>Stanley.</i>			
Freight, \$1,475.92 ; passengers, \$834.00 ; meals, \$25.90 ; berths, \$110.00 ; extra, \$10.80. ....	2,456 62		27,260 71
Examination, masters and mates. ....	4,314 50		4,314 50
Fines and forfeitures. ....	552 44		552 44
Steamboat inspector fund. ....	4,442 94		
" engineers certificates. ....	2,054 00		6,496 94
Sick mariners fund. ....	53,732 31	350 54	53,381 77
Signal station dues. ....	610 00		610 00
Decayed pilots fund. ....	5,805 96		5,805 96
Pilots expense account. ....			
Marine register fees. ....	52 57		52 57
Casual revenue marine. ....	38,587 38		
" fisheries. ....	13,749 44	2,363 93	49,972 89
Fisheries revenue. ....	74,223 78	30 00	74,193 78
Modus Vivendi. ....	10,876 78		10,876 78
Total. ....	256,787 85	3,228 47	253,559 38

FISHERIES revenue for fiscal Year ended March 31, 1910.

Ontario. ....	\$ 1,520 75	
Quebec. ....	4,953 46	
Nova Scotia. ....	3,845 81	
New Brunswick. ....	13,044 88	
Prince Edward Island. ....	2,359 93	
Manitoba. ....	3,962 88	
Saskatchewan. ....	1,209 44	
Alberta. ....	703 00	
Hudson Bay Territory. ....	301 83	
British Columbia. ....	41,864 80	
Yukon. ....	457 00	
		\$74,223 78
Modus Vivendi. ....		\$10,876 78



SESSIONAL PAPER No. 21

FOR the Year ended March 31, 1910, Minor Public Works—Revenue—Wharfs, Piers and Harbours.

Locality.	Wharfinger.	Date of appointment.	Renumeration. allowed.	Amount.
<i>Ontario.</i>			p.c.	\$ cts.
Amherstburg Harbour.....	M. Barrett.....	Dec. 29, 1906..	\$200 00	14 50
Blind River.. .....	W. H. McGauley.....	April 14, 1908..	50	723 92
Bronte.....	J. J. Wilson .....	Oct. 26, 1905..	25	57 50
Bruce Mines.....	W. Fleming.....	April 15, 1902..	25	127 24
Burks Falls.....	A. J. Collins.....	Feb. 8, 1907..	25	58 13
Chute à Blondeau.....	O. Cousineau.....	May 28, 1909..	40	120 56
Cooks Bay.....	C. Kent.....		50	22 00
Echo Bay.....	T. W. Trotter .....	Oct. 9, 1908..	25	8 33
Fort William Harbour.....	J. McAllister.....	May 27, 1907..	\$600 00	181 40
Goderich.....	W. Marlton.....	Feb. 14, 1894..	25	700 00
Haileybury.....	R. B. Jessup.....	May 8, 1908..	25	405 30
Hilton.....	E. Stubbs.....	June 20, 1894..	50	233 02
Kingsville.....	W. H. Black.....	Aug. 1, 1902..	25	116 37
L'Orignal.....	E. A. Hall.....	May 23, 1904..	25	245 64
Leamington.....	J. E. Johnson.....	May 23, 1906..	25	74 57
Midland .....	J. Yates. ....	Oct. 26, 1905..	25	371 98
North Bay... ..	P. Kinsella.. ..	June 30, 1905..	25	27 50
Oshawa. . . . .	W. T. Henry.....	Aug. 10, 1904..	25	10 00
Pelee Island.....	H. Henderson.....	Feb. 2, 1907..	25	206 77
Pembroke.....	T. Anderson.....	April 27, 1906..	50	100 00
Richards Landing .....	R. Armstrong.....	June 10, 1907..	50	141 95
Rondeau.....	W. R. Fellows.....	Dec. 17, 1893..	25	37 48
Rosseau.....	A. Monteith.....	Aug. 6, 1908..	50	157 02
Sault Ste Marie.....	G. S. Boyd.....	April 9, 1897..	\$100 per month during naviga- tion season....	633 59
Scudder Dock.....	C. B. Quick.....	July 29, 1909..	25	64 81
Sheguiandah.....	F. G. R. Bradbury..	Mar. 16, 1906..	25	140 47
South Lancaster.....	J. D. Perron.....	May 6, 1907..	25	118 77
Thessalon.....	D. J. Sandie.....	April 22, 1902..	50	199 65
Treadwell... ..	J. Smith.....	May 18, 1909..	40	111 29
Wendover.....	H. Lacasse.....	Jan. 14, 1907..	50	34 47
Wiarton.....	W. Gilbert.....	Nov. 13, 1907..	25	217 52
				\$5,661 75



FOR the Year ended March 31, 1910, Minor Public Works—Revenue—Wharfs, Piers and Harbours—Continued.

Locality.	Wharfinger.	Date of appointment.		Renumeration allowed.	Amount.
Quebec.				p. c.	\$ cts.
Anse aux Gascons.....	S. Chapados.....	Feb.	16, 1906..	25	83 37
Anse à L'Islet.....	G. Mollog.....			25	47 15
Anse St. Jean.....	F. Lavoie.....	May	13, 1905..	\$19 per annum..	68 47
Baie St. Paul.....	E. Coude.....	Oct.	26, 1905..	\$32 per annum..	68 45
Beauport.....	Placide Langlois.....	Oct.	19, 1909..	50	20 70
Berthier.....	J. Blais.....	Nov.	7, 1905..	50	93 31
Carleton.....	B. Leclerc.....	June	13, 1905..	50	35 50
Cap à L'Aigle.....	S. Dufour.....	May	11, 1906..	\$18 per annum..	40 00
Chicoutimi.....	T. Tremblay.....	May	23, 1901..	\$122 per annum..	336 97
Coteau Landing.....	E. Duchantal.....	Feb.	1, 1909..	25	40 68
Desjardins.....	P. Desjardins.....	Mar.	31, 1906..	25	25 00
Grand River.....	G. Beaudin.....	Nov.	16, 1896..	25	177 86
Hudson.....	A. W. Mullan.....	July	13, 1904..	50	63 56
Ile aux Grues.....	D. Vézina.....	June	13, 1904..	25	0 45
Lacolle.....	R. J. Robinson.....	Mar.	8, 1894..	25	6 63
Les Eboulements.....	W. Bouchard.....	May	7, 1906..	\$29 per annum..	62 00
L'Islet.....	Under Lease.....				25 00
Longueuil.....	E. Denicourt.....	May	15, 1901..	25	22 44
Magog.....	D. Peters.....	June	15, 1906..	50	68 09
Matane.....	Louis Durette.....	Aug.	25, 1900..	50	166 03
Murray Bay.....	J. Gagnon.....	May	16, 1906..	\$40 per annum..	117 05
New Carlisle.....	J. Chisholm.....	April	22, 1902..	25	127 00
Paspebiac.....	Julien de Caen.....	Feb.	22, 1908..	50	15 75
Peel Head Bay.....	S. N. Ray.....			25	33 00
Percé.....	E. Bourget.....	April	26, 1910..	40	247 05
Port Daniel.....	F. X. Gagnon.....	Feb.	26, 1907..	\$50 per annum..	125 09
Rimouski.....	U. Lavoie.....	Mar.	27, 1907..	50	146 60
Rivière du Loup.....	L. J. Puize.....	Nov.	7, 1905..	\$146 per annum..	369 99
St. Alphonse de Bagotville.....	T. Fortier.....	April	20, 1909..	\$48 per annum..	121 40
Ste. Anne de Bellevue.....	M. C. Bezner.....	May	21, 1908..	50	194 90
Ste. Cécile du Bic.....	Jos. Santerre.....	May	28, 1909..	25	6 59
St. Jean Port Joli.....	Under lease.....				25 00
St. Johns Harbour.....	G. H. Farrar.....	July	21, 1908..	\$600 per annum..	133 00
St. Laurent d'Orléans.....	J. Godbout.....	May	11, 1904..	50	21 07
St. Nicholas.....	Under lease.....				25 00
St. Siméon.....	H. Savard.....	May	7, 1908..	25	13 47
St. Thomas de Montmagny.....	L. Dionne.....	Oct.	22, 1896..	25	64 90
St. Zotique.....	A. Bissonnette.....	May	7, 1906..	25	8 25
Sorel Harbour.....	J. A. Proulx.....	June	6, 1901..	\$400 per annum..	5 50
Tadoussac.....	A. Gingras.....	May	29, 1906..	\$30 per annum..	111 00
					3,363 27
Refunds.....					484 00
					2,879 27



## SESSIONAL PAPER No. 21

For the Year ended March 31, 1910, Minor Public Works—Revenue—Wharfs, Piers and Harbours—*Continued.*

Locality.	Wharfinger.	Date of appointment.	Remuneration allowed.	Amount.
<i>Nova Scotia.</i>			p. c.	\$ cts.
Babine Cove .....	A. Thomas .....	Oct. 20, 1897..	25	5 23
Barrington Passage .....	J. H. Christie .....	Aug. 31, 1896..	25	378 39
Bayfield .....	R. Grant .....	April 23, 1902..	25	15 76
Battery Point .....	J. W. Ellis .....	Nov. 27, 1907..	25	3 04
Belliveau Cove .....	S. C. Theriault .....	Nov. 24, 1892..	25	119 72
Black Point .....	J. P. Littlewood .....	Jan. 8, 1904..	25	19 96
Bridgewater Hbr .....	W. Oakes .....	Jan. 28, 1896..	\$100 per annum.	29 50
Brooklyn .....	J. McLeod .....	Aug. 3, 1904..	25	61 87
Canada Creek .....	H. Dickey .....	Aug. 12, 1899..	25	2 60
Cape Cove .....	B. Doucette .....	Feb. 8, 1907..	25	2 85
Centreville .....	A. Ward .....	May 23, 1897..	25	100 65
Chipmans Brook .....	Henry Thorpe .....	April 11, 1909..	25	2 52
Church Point .....	L. Belliveau .....	March 20, 1907..	25	58 80
Delaps Cove .....	R. W. McCaul .....	Nov. 28, 1889..	25	5 64
D'Escousse .....	Leon Poirier .....	May 31, 1906..	25	27 13
Digby .....	W. W. Hayden .....	April 20, 1897..	25	2,604 67
Freeport .....	W. H. Thurber .....	.....	..	43 46
Granville Centre .....	H. Rooney .....	July 6, 1903..	25	61 12
Halls Harbour .....	T. A. Neville .....	Jan. 8, 1897..	25	79 92
Hampton .....	C. Dunn .....	Dec. 22, 1906..	25	22 44
Harbourville .....	L. D. Curry .....	Dec. 29, 1906..	25	29 41
Hortons Landing .....	F. G. Curry .....	April 30, 1898..	25	11 49
International Pier .....	M. J. Neville .....	Oct. 30, 1880..	\$300 per annum.	7 50
Jordan Bay .....	J. Fredericks .....	Feb. 20, 1900..	25	49 52
Margaretsville .....	D. H. McLen .....	July 10, 1907..	25	112 27
Meteghan Cove .....	M. S. Robichaud .....	Dec. 7, 1900..	25	16 02
Meteghan River .....	Jas. McLair .....	May 28, 1909..	25	13 06
Morden .....	John Duggan .....	April 7, 1910..	25	9 50
Oak Point .....	Under lease .....	.....	..	200 00
Ogilvie .....	J. L. Swindle .....	March 4, 1907..	25	26 85
Parkers Cove .....	D. Milner .....	Sept. 3, 1903..	25	12 72
Picketts .....	F. Eaton .....	Aug. 2, 1899..	25	99 15
Plympton .....	W. K. Smith .....	Aug. 8, 1890..	25	22 56
Port George .....	O. Douglas .....	June 20, 1900..	25	50 01
Port Hawkesbury .....	F. McInnis .....	March 20, 1907..	25	237 32
Port Latour .....	C. D. Cook .....	Aug. 20, 1904..	25	26 19
Port Lorne .....	F. Beardsley .....	June 22, 1897..	25	49 43
Port Maitland .....	J. Ellis .....	.....	25	24 46
Port Morien .....	D. F. McAuley .....	Nov. 6, 1906..	7½	429 53
Port Mouton .....	Geo. Cook .....	Dec. 28, 1905..	25	10 08
Port Phillip .....	H. Johnson .....	Sept. 3, 1909..	25	1 41
Port Wade .....	J. D. Apt .....	Sept. 12, 1907..	25	38 93
Sandford .....	A. Shaw .....	May 26, 1903..	25	5 19
Saulnierville .....	J. T. Saulnier .....	Aug. 25, 1888..	25	8 76
Shag Harbour .....	A. Smith .....	Oct. 26, 1905..	25	7 28
Swims Point .....	J. T. Duncan .....	Jan. 30, 1909..	25	83 63
Tiverton .....	B. Blackford .....	Oct. 17, 1906..	25	87 73
Victoria .....	A. West .....	Dec. 4, 1900..	25	0 81
West Arichat .....	H. H. Sampson .....	June 20, 1909..	25	29 70
West Pubnico .....	C. C. D'Entrement .....	March 28, 1898..	25	11 90
Whycocomah .....	D. Levingston .....	Dec. 22, 1906..	25	69 40
Wolfville .....	J. L. Franklin .....	.....	..	29 38
				5,456 46



For the Year ended March 31, 1910, Minor Public Works—Revenue—Wharfs, Piers and Harbours—Continued.

Locality.	Wharfinger.	Date of appointment.	Remuneration allowed.	Amount.
<i>New Brunswick.</i>			p. c.	\$ cts.
Andersons Hollow.....	W. C. Anderson.....	Feb. 13, 1899...	25	245 93
Black River.....	F. McLeod.....	Sept. 26, 1907...	25	49 50
Campbellton.....	G. E. Asker.....	May 11, 1904...	25	2,214 37
Cape Tormentine.....	M. B. Rielly.....	June 23, 1905...	25	472 52
Caraquet.....	H. Friolet.....	Sept. 11, 1906...	25	100 00
Dalhousie.....	W. S. Smith.....	June 27, 1891...	25	468 13
Gardners Creek.....	J. J. Armstrong.....	Dec. 22, 1909...	25	4 69
Hopewell Cape.....	G. D. Wilson.....	April 10, 1899...	25	41 48
Petit Rocher.....	J. Boudreau.....	Aug. 27, .....	25	10 19
Tracadie.....	P. Savoy.....	Sept. 23, 1889...	25	32 29
				3,639 10
<i>Prince Edward Island</i>				
Annandale.....	W. C. Jenkins.....	May, 4, 1897...	25	78 40
Bay View.....	J. Harrington.....	Oct. 3, 1885...	25	14 59
Belfast.....	J. F. Halliday.....	May 1, 1901...	25	71 75
Brush Wharf.....	H. McDonald.....	April 21, 1910...	25	32 78
Chapel Point.....	R. McCormack.....	Sept. 18, 1885...	25	27 32
Charlottetown.....	T. G. Taylor.....	Agent of Dept.....		1,179 57
Clifton.....	John Gunn.....	May 24, 1900...	25	11 84
Crapaud and Victoria.....	E. McKinnon.....	July 7, 1897...	25	229 95
Georgetown.....	R. R. Jenkins.....	Oct. 14, 1892...	25	16 66
Haggertys.....	C. Fisher.....	March 27, 1908...	25	20 55
Hickeys.....	M. Webster.....	Oct. 22, 1896...	25	47 40
Kiers Shore.....	W. Hodgson.....	June 10, 1895...	25	105 08
McPhersons Cove.....	J. L. McPherson.....	Nov. 6, 1908...	25	14 20
Murray Harbour North.....	J. McKinnon.....	Jan. 27, 1896...	25	13 36
North Cardigan.....	R. J. Steele.....	May 1, 1901...	25	49 35
Pownal.....	M. M. Haley.....	Oct. 13, 1896...	35	52 81
St. Marys Bay.....	Angus R. Steele.....	April 20, 1910...	25	18 32
South Rustico.....	D. Gallant.....	.....		4 84
Sturgeon Pier.....	N. Randall.....	Dec. 31, 1908...	25	32 55
Tignish.....	A. G. Gaudet.....	Aug. 23, 1898...	25	11 32
Vernon River.....	W. M. Forbes.....	April 22, 1902...	25	55 05
Wood Island.....	Jas. Young.....	April 10, 1899...	25	2 61
				2,090 30
<i>British Columbia.</i>				
Comox Harbour.....	Geo. H. Rowe.....	April 25, 1896...	200 per annum..	95 50
Ladysmith.....	T. D. Conway.....	.....	25	14 16
Nanaimo Harbour.....	Jas. Knarston.....	Oct. 26, 1905...	500 per annum..	6 00
Sidney Harbour.....	Hugh Moon.....	May 15, 1909...	25	160 50
Vancouver Harbour.....	M. McLeod.....	Jan. 14, 1897...	600 per annum..	7 00
Victoria Harbour.....	C. E. Clarke.....	Nov. 3, 1894...	600 per annum..	31 00
				314 16
Resume wharfage and harbour dues.				Amount.
				\$ cts.
Ontario.....				5,661 75
Quebec.....				2,879 27
Nova Scotia.....				5,456 46
New Brunswick.....				3,639 10
Prince Edward Island.....				2,090 30
British Columbia.....				314 16
				20,041 04



## SESSIONAL PAPER No. 21

STATEMENT of minor revenue collected during the year ended March 31, 1910.  
Sick Mariners' dues.

Name of port.	Amount.	Name of port.	Amount.
PROVINCE OF QUEBEC.	\$ cts.	PROVINCE OF NOVA SCOTIA.— <i>Con.</i>	\$ cts.
Gaspé .....	118 90	Liverpool.....	196 69
Montreal.....	5,272 28	Lockeport.....	7 29
Paspébiac.....	219 03	Lunenburg.....	569 15
Percé.....	99 72	North Sydney.....	1,108 12
Quebec.....	5,818 11	Parrsboro.....	506 09
Rimouski.....	164 66	Pictou .....	195 40
St. Armand.....	11 60	Port Hawkesbury.....	142 62
St. Johns.....	1,386 30	Port Hood.....	115 42
Sorel .....	57 52	Shelburne.....	53 47
Three Rivers.....	254 68	Sydney.. ..	2,451 30
	13,402 80	Truro.....	3 96
NEW BRUNSWICK.		Weymouth.....	234 36
Bathurst.....	165 80	Windsor.....	1,111 03
Campbellton.....	429 14	Yarmouth.....	496 54
Chatham.....	708 27		16,844 87
Dalhousie.....	476 42	PROVINCE OF BRITISH COLUMBIA.	
Fredericton.....	33 40	Nanaimo.....	5,294 38
Moncton .....	519 65	New Westminster.....	225 12
Newcastle.....	335 19	Prince Rupert .....	462 25
Sackville.....	131 92	Vancouver.....	2,290 03
St. Andrews.....	80 80	Victoria.....	5,472 32
St. John.....	6,486 27		13,744 10
St. Stephen.....	46 02	PRINCE EDWARD ISLAND.	
	9,412 88	Charlottetown.....	259 70
PROVINCE OF NOVA SCOTIA.		Summerside.....	67 96
Amherst.....	312 90		327 66
Annapolis.....	216 04	GRAND TOTALS BY PROVINCES.	
Antigonish.....	0 90	Quebec.....	13,402 80
Arichat.....	19 08	New Brunswick.....	9,412 88
Baddeck.....	45 48	Nova Scotia.....	16,844 87
Barrington.....	19 37	British Columbia.....	13,744 10
Canso.....	72 63	Prince Edward Island.....	327 66
Digby.....	90 55		53,732 31
Glace Bay.....	5 26		
Halifax.....	8,794 67		
Kentville.....	16 55		



STATEMENT of steamboat inspection dues collected for the fiscal year ended  
March 31, 1910.

Name of port.	Amount.	Name of port.	Amount.
PROVINCE OF ONTARIO.	\$ cts.	PROVINCE OF NOVA SCOTIA.	\$ cts.
Sault Ste. Marie.....	45 68	Halifax.....	1,340 32
Toronto.....	205 44	Kentville.....	255 84
Windsor.....	138 40	North Sydney.....	92 40
Total .....	389 52	Total.....	1,688 56
PROVINCE OF QUEBEC.		PROVINCE OF MANITOBA.	
Quebec .....	448 86	Winnipeg.....	Nil.
PROVINCE OF NEW BRUNSWICK.		PROVINCE OF BRITISH COLUMBIA.	
St. John.....	306 88	Vancouver.....	938 32
		Victoria.....	670 80
		Total .....	1,609 12

STATEMENT of marine register dues collected for the fiscal year ended March 31, 1910.

Name of port.	Amount.	Name of port.	Amount.
PROVINCE OF ONTARIO.	\$ cts.	PROVINCE OF NOVA SCOTIA— <i>Con.</i>	\$ cts.
Belleville ..	1 28	Liverpool..	1 10
Kingston.....	1 12	Lunenburg ..	3 60
Ottawa.....	1 60	Shelburne....	0 48
Picton.....	0 96	Yarmouth.....	2 09
Sarnia.....	0 20	Total.....	10 45
Toronto.....	0 80	PROVINCE OF MANITOBA.	
Total.....	5 96	Winnipeg ....	3 80
PROVINCE OF QUEBEC.		PROVINCE OF BRITISH COLUMBIA.	
Montreal.....	8 40	Victoria.....	3 28
Quebec.....	11 58	PRINCE EDWARD ISLAND.	
Total.....	19 98	Charlottetown....	1 80
PROVINCE OF NEW BRUNSWICK.		YUKON DISTRICT.	
St. John.....	3 80	Dawson.....	3 50
PROVINCE OF NOVA SCOTIA.		Grand total.....	52 57
Arichat.....	0 70		
Halifax.....	2 48		



## SESSIONAL PAPER No. 21

STATEMENT of lighthouse and coast dues collected for the fiscal year ended  
March 31, 1910.

## PROVINCE OF NOVA SCOTIA.

Halifax.....	\$610 00
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## RESUME OF MINOR REVENUE.

Sick mariners dues.....	\$53,732 31
Steamboat inspection fund.....	4,442 94
Marine register fees.....	52 57
Signal station dues.....	610 00
Grand total.....	\$58,837 82

## HARBOUR MASTERS.

TABLE showing the names of ports proclaimed under certain Dominion Acts, the provisions of which are found in the Canada Shipping Act, Chapter 113, Revised Statutes of Canada, 1906, for the appointment of harbour masters, and date of their appointment, the amounts which each of their salaries is not to exceed, the amount of fees collected by each of them during the calendar year ended December 31, 1909, and the overplus, if any, paid to the credit of the Receiver General, for the year ended December 31, 1909.

## PROVINCE OF ONTARIO.

Names of port.	Harbour masters.	Date of appointment.	Amount collected.	Remuneration allowed.	Amount paid to Cr. R. G.
			\$ cts.	\$ cts.	\$ cts.
Amherstburg.....	M. Barrett.....	Dec. 29, 1906.	214 50	200 00	14 50
Bronte.....	J. Wilson.....	Oct. 26, 1905.	4 50	200 00	
Byng Inlet.....	C. E. Begin.....	Mar. 24, 1908.	22 00	200 00	
Collingwood.....	Wm. F. Toner.....	Dec. 31, 1908.	195 50	300 00	
Depot Harbour.....	John O'Grady.....	April 18, 1910.	46 50	200 00	
Fort William.....	J. McAllister.....	May 12, 1906.	782 00	600 00	P. O. 60c. 181 40
French River.....	E. Barron, Jr.....		16 00	200 00	
Goderich.....	D. McKay.....	April 21, 1908.	114 00	300 00	
Little Current.....	J. T. May.....	July 19, 1906.		200 00	
Meaford.....	S. McClain.....	" 16, 1902.	32 50	200 00	
Midland.....	J. White.....	" 13, 1907.	154 50	200 00	
Owen Sound.....	W. T. Robertson.....	May 19, 1909.	74 50	200 00	
Oshawa.....	W. T. Henry.....	Aug. 10, 1904.	Nil.	300 00	
Parry Sound.....	Basil Taylor.....	April 27, 1909.	48 00	200 00	
Penetanguishene.....	P. Light.....	May 7, 1906.	21 50	200 00	
Port Arthur.....	B. Guérard.....	" 21, 1897.	284 00	300 00	
Port Stanley.....	F. E. Shephard.....	Jan. 15, 1898.		200 00	
Rondeau.....	W. R. Fellows.....	Dec. 17, 1888.	30 00	100 00	
Southampton.....	W. H. Johnston.....	Oct. .., 1882.	35 50	100 00	
".....	Geo. McVittie, depy. h. m.				
Sarnia.....	R. McAdam.....	May 3, 1886.	Nil.	300 00	
Trenton..	O. C. Lawson.....	Nov. 12, 1904.		200 00	

## PROVINCE OF QUEBEC.

Amherst Harbour.....	J. Cassidy.....	Sept. 2, 1878.	6 00	200 00	
Anse au Gascon .....	J. Mourant.....	June 28, 1905.	Nil.	100 00	
Bonaventure.....	A. Bourque.....	June 5, 1905.	Nil.	100 00	
Bersimis.....	Laurent Thibault.....	Dec. 13, 1905.	Nil.	200 00	
Cape Cove.....	J. Scott.....	July 15, 1908.	50	200 00	
Carleton.....	Bernard Leclerc.....	May 15, 1905.	Nil.	200 00	
Caplin.....	Theo. Bourdages.....	Mch. 20, 1907.		100 00	
Chicoutimi.....	A. Sturton.....	June 8, 1886.	68 00	200 00	
Grand Entry.....	Andre Cyr.....	July 10, 1907.	4 00	200 00	
Grand River.....	G. Beaudin .....	Apr. 8, 1900.	13 00	100 00	



TABLE showing the names of ports proclaimed under certain Dominion Acts—*Con.*  
PROVINCE OF QUEBEC—*Continued.*

Names of ports.	Harbour masters.	Date of appointment.	Amount collected.		Remuneration allowed.		Amount paid to Cr. R. G.	
			\$	c.	\$	c.	\$	c.
Gaspe.....	F. G. Eden.....	Apr. 3, 1889.	92	50	500	00		
House Harbour.....	C. Lafrance.. . . .	Dec. 10, 1896.	29	50	200	00		
Maria.....	A. Cyr.....	Mch. 29, 1905.	Nil.		100	00		
Matane.....	L. J. Levasseur.....	Dec. 12, 1896.	77	50	200	00		
Malbaie.....	P. Lawrence.....		10	00	200	00		
Metis.....	J. W. Ferguson.....	Mar. 10, 1896.	...	...	200	00		
New Carlisle.....	J. Chisholm. . . . .	Apr. 22, 1902.	1	00	200	00		
New Richmond.. . . .	F. X. Cormier.....	Apr. 15, 1902.	54	00	200	00		
Nouvelle.....	J. Casey.....	Jan. 3, 1903.	Nil.		200	00		
Oak Bay.....	T. Harper.....	Sept. 11, 1909.	40	00	200	00		
Paspebiac.....	W. L. Kempffer.....	Sept. 21, 1900.	49	50	150	00		
Perce.....	E. Donohue.....	Oct. 10, 1903.	7	50	100	00		
Port Daniel.....	B. Langlois.....	Feb. 26, 1907.	21	00	200	00		
Rimouski.....	A. P. St. Laurent.....	May 13, 1896.	65	00	200	00		
Riv. du Loup . . . . .	F. E. Gilbert.....	Oct. 5, 1908.	15	00	100	00		
St. Godfroy.....	Jacques Grenier.....	June 5, 1905.	...	...	100	00		
St. Ths. Montmagny.....	L. Dionne... . . . .	Oct. 22, 1896.	48	50	200	00		
St. Johns . . . . .	G. H. Farrar . . . . .	Mar. 20, 1897.	733	00	600	00	133	00
Sorel.....	J. A. Proulx.....	June 6, 1901.	405	50	400	00	5	50
Trois Pistoles . . . . .	E. T. Pettigrew.....	Apr. 11, 1899.	Nil.		100	00		
Tadousac . . . . .	A. Gingras . . . . .	June 6, 1906.	10	00	200	00		
			1,761	00			138	50

PROVINCE OF NEW BRUNSWICK.

Alma.....	G. W. Parsons.....	Mar. 2, 1908.	22	00	100	00		
Bathurst . . . . .	Capt. M. Daly . . . . .	April 15, 1907.	50	00	200	00		
Black and Beaver.....	E. W. Cross . . . . .	Sept. 17, 1883.	16	50	100	00		
Bouctouche.....	H. Hutchison.....	April 17, 1897.	10	50	100	00		
Campbellton.....	G. E. Asker . . . . .	May 5, 1904.	119	00	200	00		
Campobello.....	Geo. Lank.....	May 17, 1910.	...	...	100	00		
Cap Tormentine.....	M. S. Treene.....	May 13, 1901.	25	00	200	00		
Caraquet.....	J. A. Albert.....	Nov. 7, 1905.	13	50	150	00		
Chatham.....	R. J. Walls . . . . .	April 13, 1898.	188	00	300	00		
Cocagne . . . . .	T. Bourque . . . . .	June 23, 1905.	50		100	00		
Dalhousie . . . . .	W. S. Smith.....	Mar. 19, 1888.	141	00	200	00		
Dorchester.....	J. Shea . . . . .	Oct. 25, 1900.	26	00	200	00		
Fairhaven.....	A. Calder.....	July 30, 1901.	10	00	200	00		
Grand Manan, N.....	J. E. Caskell . . . . .	Mar. 20, 1907.	10	50	100	00		
Grand Harbour . . . . .	T. Ingalls.....	April 19, 1907.	5	00	100	00		
Gull Rock Channel....	G. A. Johnson.....	April 27, 1904.	Nil.		100	00		
Harvey . . . . .	Wm. Woods.....	June 9, 1903.	45	50	100	00		
Heron Channel . . . . .	D. Robertson . . . . .	July 15, 1897.	...	...	200	00		
Hillsborough . . . . .	J. O'Shaughnessy.....	April 13, 1898.	32	00	150	00		
Hopewell Cape . . . . .	J. H. Christopher.....	April 13, 1898.	15	50	200	00		
Ledge of St. Stephens....	Wm. McBean . . . . .	June 12, 1894.	Nil.		100	00		
Letete . . . . .	H. W. Harris.....	Feb. 16, 1906.	5	50	100	00		
Little Shippigan.. . . .	Jos. Beaudin.....	Oct. 27, 1906.	Nil.		100	00		
Moncton . . . . .	Benj. Toombs.....	April 12, 1905.	31	00	200	00		
Musquash . . . . .	J. McNulty.....	Sept. 28, 1896.	3	00	100	00		
Newcastle.....	J. Russell . . . . .	June 27, 1904.	107	50	300	00		
Port Elgin & Baie Verte...	C. Trenholme . . . . .	April 3, 1907.	3	00	200	00		
Pokemouche.....	M. Landry.....	May 13, 1901.	Nil.		100	00		
Richibucto.....	J. Jardine.....	May 11, 1874.	33	00	200	00		
Sackville . . . . .	E. Chase.....	May 11, 1904.	15	00	200	00		
St. Andrews.....	Capt. R. Keay.....	Feb. 16, 1909.	34	50	100	00		
St. George . . . . .	G. W. McKenzie . . . . .	May 10, 1900.	32	00	100	00		
St. Martin & Quaco.....	J. R. McDonough . . . . .	July 11, 1902.	68	50	100	00		
Seal Cove.....	J. W. Wooster.....	April 19, 1907.	28	00	100	00		
Shediac... . . . .	Capt. J. Newman. . . . .	Dec. 31, 1909.	33	00	300	00		
Shippigan . . . . .	J. Degrace.....	April 14, 1903.	6	00	100	00		
Tracadie.....	T. Savoy.....	Sept. 23, 1899.	9	50	100	00		
Waterside . . . . .	W. C. Anderson . . . . .	May 24, 1901.	7	50	100	00		
West Isles.....	B. Simpson.....	May 27, 1901.	14	00	200	00		
Whitehead . . . . .	A. Cheney . . . . .	April 19, 1907.	5	00	100	00		



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TABLE showing the names of ports proclaimed under certain Dominion Acts—*Con.*  
PROVINCE OF NOVA SCOTIA.

Names of ports.	Harbour masters.	Date of appointment.	Amount collected.		Remuneration allowed.		Amount paid to Cr. R. G.	
			\$	c.	\$	c.	\$	c.
Abbots Harbour.....	F. D'Entremont.....	May 23, 1901.	5	00	200	00		
Advocate.....	Geo. Loomer.....	April 20, 1910.	2	00	100	00		
Amherst.....	F. A. Gates.....	April 3, 1907.	31	50	300	00		
Annapolis.....	J. Lindgren.....	July 7, 1908.	74	50	200	00		
Arichat.....	J. Langlois.....	Mar. 22, 1909.	27	00	200	00		
Apple River.....	B. Atkinson.....	Feb. 1, 1909.	21	50	200	00		
Baddeck.....	P. L. McFarlane.....	May 6, 1909.			100	00		
Barrington.....	B. Kenny.....	July 6, 1903.	29	50	200	00		
Bayfield.....	David Sutton.....	Mar. 22, 1910.						
Bay St. Lawrence.....	R. G. Zwicker.....	April 21, 1887.	Nil.		200	00		
Bear River.....	W. McFadden.....	Sept. 27, 1897.	27	50	100	00		
Beaver Harbour.....	H. Hawbott.....	Sept. 22, 1888.	1	50				
Big Harbour.....	D. G. McKenzie.....	April 18, 1908.			100	00		
Bridgewater.....	W. Oakes.....	Jan. 28, 1896.	129	50	100	00	29	50
Big Bras d'Or.....	A. Bain.....	Feb. 14, 1905.	1	00	200	00		
Cape Canso.....	G. Oliver.....	Feb. 14, 1905.	99	00	150	00		
Cape Negro.....	A. D. Parry.....	May 18, 1881.	8	50	200	00		
Chester.....	A. C. Corkum.....	July 8, 1896.	13	00	100	00		
Cheticamp.....	F. Aucoin.....	April 15, 1876.	1	00	100	00		
Clarks Harbour.....	J. G. Nickerson.....		68	00	200	00		
Clementsport.....	J. M. LeCain.....	Oct. 18, 1898.	8	50	150	00		
Crow Harbour.....								
D'Escousse.....	M. Martell.....	April 22, 1902.	9	50	100	00		
Digby.....	H. Anderson.....	June 19, 1902.	48	00	200	00		
East Bay.....	D. McInnes.....	April 4, 1886.			100	00		
Gabarouse.....	R. McLean, acting H.M.				100	00		
Glasgow & Cape Breton Pier.....	A. McQuarrie.....	Oct. 30, 1880.	46	00	300	00		
Guysboro.....	A. M. Peart.....	Feb. 11, 1902.	3	00	100	00		
Halifax.....	F. G. Rudolf.....	May 13, 1910.	1,474	50	1,800	00		
Hantsport.....	W. McCulloch.....	Jan. 17, 1892.	200	50	300	00		
Ingonish S. Bay.....	J. Doucett.....	April 30, 1901.	16	00	100	00		
Ingonish North.....	Angus McLean.....	April 21, 1910.	Nil.		200	00		
Ingram River.....	E. Huntly.....	Jan. 19, 1907.	50	00	100	00		
Int. Pier, Sydney.....	M. J. Neville.....	Oct. 30, 1880.	307	50	300	00	7	50
Isaacs Harbour.....	T. D. Cook.....	June 19, 1900.	10	00	100	00		
Jeddore.....	E. Baker.....	Dec. 3, 1903.	10	50	100	00		
Jordan Bay.....	F. Thorburn.....	May 11, 1901.	7	50	150	00		
Kelly Cove.....	J. Kenny.....	April 6, 1908.	1	00	100	00		
La Have or Getson's Cove.....	G. H. Zwicker.....	Feb. 26, 1875.	46	50	300	00		
L'Ardoise, Upper and Lower.....	G. Burke.....	Aug. 29, 1884.	4	50	100	00		
Lingan.....	No H. M.....							
Liscombe.....	L. Wilson.....	Feb. 20, 1900.	21	50	200	00		
Little Bras d'Or Lake between McKay's Point and Grand Narrows.....	D. J. Campbell.....	April 17, 1899.	Nil.		100	00		
Little Bras d'Or Harbour.....	J. M. Leblanc.....	Oct. 9, 1909.	Nil.		200	00		
Little Bras d'Or, Lake between McKay's Pt. and Washadebuck Riv.....	Vincent McLean.....	Sept. 23, 1907.	Nil.		100	00		
Little Glace Bay.....	E. Douglas Rigby.....	May 8, 1884.	16	50	200	00		
Little Narrows to Cranberry Point.....	K. McLeenan.....	Nov. 1, 1897.	Nil.		100	00		
Liverpool.....	J. Ryan.....	Dec. 22, 1906.	131	50	200	00		
Lockeport.....	G. J. Locke.....	April, 2, 1906.			100	00		
Louisburg.....	H. C. Levatte & As.....	Oct. 13, 1898.	346	50	350	00		
Lunenburg.....	J. Heckman, Jr.....	Nov. 1, 1909.	140	00	150	00		
Mabou.....	J. McInnes.....	July 11, 1900.	2	50	100	00		
Mahone Bay.....	A. Hyson.....	Feb. 18, 1908.	28	50	200	00		
McNairs Cove.....	R. McEachern.....	Mar. 8, 1875.			50	00		
Marble Mountain.....	D. McDonald.....	July 26, 1892.	1	50	200	00		
Margaretsville.....	J. McGranaghan.....	May 29, 1906.	1	00	100	00		
Margaret's Bay.....	H. C. Garriison.....	Dec. 14, 1901.	6	50	100	00		
Margaree.....	M. A. Dunn.....	Mar. 6, 1909.	2	00	100	00		
Marie Joseph.....	C. Dixon.....	Feb. 2, 1907.	3	50	100	00		



TABLE showing the names of ports proclaimed under certain Dominion Acts—*Con.*  
PROVINCE OF NOVA SCOTIA—*Continued.*

Names of Ports.	Harbour Masters.	Date of Appointment.	Amount collected.	Remuneration Allowed.	Amount paid to Cr. C. R.
			\$ c.	\$ c.	\$ c.
Meteghan Hbr.....	J. McLair.....	Nov 17, 1906.	10 50	100 00	
Meteghan River.....					
Merigomish.....	T. B. Olding.....	Mar. 11, 1910.		200 00	
McKinnons Hbr.....	D. T. McNeil.....	Oct. 9, 1909.		200 00	
Musquodoboit.....	T. Williams.....	May 31, 1905.	3 50	100 00	
Neils Harbour.....	R. Payne.....	July 15, 1905.	5 50	100 00	
New Haven.....					
Noel.....	S. O'Brien.....	Oct. 26, 1905.	5 00	200 00	
Northport.....	J. Davis.....	Dec. 21, 1902.	23 00	100 00	
North West Cove.....	P. Bouthier.....	June 30, 1892.		200 00	
Parrsboro.....	R. T. Smith.....	Apr. 30, 1892.	171 00	300 00	
Petit de Gras.....	S. Boudrot.....	June 5, 1895.	15 00	200 00	
Petite Rivière Bridge.....	J. Nelson Parks.....	Apr. 27, 1888.	1 00	100 00	
Port Greville.....	Austin Graham.....	April 27, 1909.	38 50	200 00	
Pictou Harbour.....	Harbour Comm.....		736 29	300 00	
Port George.....					
Port Hastings.....	G. L. McLean.....	Feb. 15, 1908.	78 00	200 00	
Port Hawkesbury.....	John Lamey.....	June 2, 1908.	32 00	200 00	
Port Hood.....	J. H. Murphy.....	July 9, 1875.	1 50	200 00	
Port Latour.....	W. Sholds.....	Feb. 15, 1898.	17 00	200 00	
Port Lorne.....	F. Beardsley.....	June 9, 1897.	1 50	200 00	
Port Maitland.....	J. Ellis.....	Dec. 10, 1896.		200 00	
Port Morien.....	H. McDonald.....	Mar. 3, 1879.	29 00	400 00	
Port Mulgrave.....	J. A. McDonald.....	June 29, 1908.	14 00	200 00	
Port Medway.....	J. Hopkins.....	Feb. 13, 1903.	22 50	200 00	
Pubnico.....	D. Q. Amireau.....	Sept. 27, 1882.	44 50	100 00	
Port Wade.....	J. McQuieny.....	Oct. 14, 1907.	43 00	200 00	
Pugwash.....	G. N. Allen.....	May 15, 1907.	51 00	100 00	
River Port.....	T. J. C. Creaser.....	Jan. 8, 1901.	38 00	100 00	
Rivière Bourgeoise.....	E. C. Bouchie.....	April 9, 1886.	3 00	100 00	
River Herbert.....	W. Y. Theal.....	July 24, 1905.	5 50	100 00	
River John.....	H. Campbell.....	June 1, 1901.	Nil.	100 00	
St. Anns Bay.....	G. E. Fader.....	Sept. 21, 1906.	12 50	200 00	
St. Anns Hbr.....	A. McLeod.....	April 16, 1909.	8 00	200 00	
St. Marys River.....	R. Quinn.....	June 21, 1909.	2 00	200 00	
St. Peter's.....	P. McNeil.....	Sept. 17, 1883.	77 00	200 00	
Sambro.....	B. Smith.....	May 27, 1890.	10 50	200 00	
Sheet Harbour.....	H. Hall.....	April 11, 1898.		200 00	
Shelburne.....	J. C. Morrisson.....	May 4, 1897.	198 00	200 00	
Ship Harbour.....	C. Marks.....	June 2, 1884.		100 00	
Spencers Island.....	B. McLellan.....	May 22, 1899.	3 00	100 00	
Tangier.....	C. A. Hilchey.....	Nov. 14, 1901.	2 50	200 00	
Tatamagouche.....	W. Rielley.....	June 1, 1900.	1 50	200 00	
Tenny Cape.....	David Lingard.....	Oct. 26, 1909.	2 00	200 00	
Tiverton.....	J. Blackford.....	April 3, 1900.	9 50	100 00	
Tidnish.....	R. B. Davison.....	Feb. 19, 1910.		100 00	
Torbay.....	S. Fougère.....	Aug. 25, 1903.	12 00	200 00	
Tusket.....	C. Doucette.....	Nov. 21, 1902.	4 00	100 00	
Tusket Wedge.....	J. LeBlanc.....	May 16, 1901.	54 00	100 00	
Wallace.....	J. D. Potton.....	Feb. 14, 1896.	3 50	100 00	
Walton.....	B. McCulloch.....	Oct. 26, 1905.	49 00	200 00	
West Arichat.....	Capt. L. Forest.....	May 25, 1910.	10 00	100 00	
West Port.....	G. Welsh.....	Jan. 29, 1898.	30 50	200 00	
West Bay.....	H. McInnis.....	May 26, 1906.		100 00	
Weymouth.....	S. McCormack.....	May 29, 1897.	68 50	200 00	
Whycocomagh.....	N. McKinnon.....	Oct. 8, 1875.		100 00	
Whitehead.....	Levi Munroe.....	Feb. 8, 1909.	17 50	200 00	
Wolfville.....	J. L. Franklin.....	Aug. 16, 1901.	7 00	100 00	
Woods Harbour.....	John Orechia.....	Nov. 20, 1909.	29 00	200 00	
Yarmouth.....	E. Scott.....	Oct. 19, 1877.	215 00	250 00	



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TABLE showing the names of ports proclaimed under certain Dominion Acts—*Con.*  
PROVINCE OF PRINCE EDWARD ISLAND.

Names of ports.	Harbour masters.	Date of appointment.	Amount collected.	Remuneration allowed.	Amount paid to Cr. R. G.
			\$ cts.	\$ cts.	\$ cts.
Alberton. ....	J. Kinch. ...	July 30, 1901.	3 00	200 00	
Charlottetown & Hills-boro River. ....	J. White. ....	Mar. 6, 1909.	114 00	400 00	
Bay Fortune. . . . .	J. R. Coffin. ....	April 29, 1875.		200 00	
Burdenell. ....	John A. Gordon. ....	Oct. 26, 1905.		200 00	
Cardigan River. ....	Felix Gallant. ....	April 27, 1909.	2 50	100 00	
Covehead. ....	Malc. Kielly. ....	April 23, 1904.		100 00	
Crapaud. ....	W. Myers. ....	June 17, 1874.	4 00	200 00	
Egmont Bay. ....	G. Henry. ....	Dec. 6, 1906.	2 00	200 00	
Georgetown. ....	J. Westawa. ....	May 16, 1904.	20 00	200 00	
Grand River. ....					
Malpeque. ....	J. Champion. ....	Dec. 10, 1896.	1 00	200 00	
Miminegash. ....	P. Doucette. ....	Jan. 21, 1908.	1 50	100 00	
Montague Bridge. ....	H. McPherson. ....	May 5, 1904.	11 00	200 00	
Murray Harbour. ....	G. McLeod. ....	Jan. 19, 1907.	4 50	200 00	
Murray River. ....	G. McLeod. ....	Feb. 9, 1897.	1 50	200 00	
New London. ....	Harry McLeod. ....	July 6, 1910.	4 50	200 00	
Pinette. ....	J. D. McDonald. ....	Oct. 23, 1903.	2 00	100 00	
Port Hill. ....	W. A. Brown. ....	June 20, 1898.		200 00	
St. Peters Bay. ....	Geo. B. Morell. ....	May 3, 1901.	8 00	200 00	
Souris, East & W. ....	J. Tierney. ....	May 15, 1905.	39 50	200 00	
Summerside. ....	J. Matheson. ....	Feb. 8, 1907.	30 00	200 00	
Tracadie. ....	J. J. McAulay. ....	April 18, 1910.	Nil	200 00	
Vernon River Bridge. . .	J. Finlay. ....	Oct. 9, 1884.	2 00	200 00	
Wood Island. ....	J. Young. ....	May 23, 1899.	Nil	100 00	

PROVINCE OF BRITISH COLUMBIA

Chemainus. ....	L. G. Hill. ....	Mar. 2, 1887.	37 00	200 00	
Comox. ....	G. H. Rowe. ....	April 25, 1896.	295 50	200 00	95 50
Ladysmith. ....	W. Fraser. ....	May 29, 1906.	183 50	200 00	
Nanaimo Departure-Bay. .	J. Knarston. ....	Oct. 26, 1905.	566 00	500 00	6 00
New Westminster. ....	W. B. Shiles. ....	Feb. 15, 1908.	210 00	400 00	
Snug Harbour. ....	Geo. C. Turnstall, jr. .	April 18, 1910.	7 00	200 00	
Vancouver. ....	D. A. McInnis. ....	Jan. 22, 1909.		600 00	
Victoria & Esquimalt. . .	C. E. Clarke. ....	Nov. 3, 1894.	631 00	600 00	31 00

RECAPITULATION.

Province.	Number of Ports.	Amount collected.	Amount paid to Receiver Gen'l.
		\$ cts.	\$ cts.
Ontario. ....	21	2,075 50	195 90
Quebec. ....	31	1,761 00	138 50
New Brunswick. ....	40	1,166 50	
Nova Scotia. ....	218	5,570 79	473 29
Prince Edward Island. ....	24	251 00	
British Columbia. ....	8	1,870 00	132 50
Totals. ....	342	12,694 79	940 19
Add Liverpool, N.S. . . . .	1	131 50	436 29



APPENDIX

STATEMENT of expenditure by the Marine Department

	1868.	1869.	1870.	1871.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Maintenance of Lights—				
Above Montreal.....	40,561 28	42,306 69	46,289 05	44,054 01
Montreal District.....	23,053 56	25,762 54	21,669 49	22,453 52
Below Quebec.....	45,615 35	41,651 73	43,730 61	31,582 75
Nova Scotia.....	46,460 72	56,394 88	43,682 86	76,230 77
New Brunswick.....	20,488 00	23,893 00	27,485 14	20,542 29
Prince Edward Island.....				
British Columbia.....				
Construction—				
Above Montreal.....	3,136 15		2,976 83	8,770 55
Quebec.....	7,323 75	7,492 59	1,543 06	
Nova Scotia.....	22,041 42	6,905 80	18,967 23	10,948 31
New Brunswick.....			11,555 91	8,735 73
Prince Edward Island.....				
British Columbia.....				
Dominion steamers—				
Quebec.....	69,026 73	37,176 02	34,549 49	59,797 05
Nova Scotia.....	14,778 92	26,603 94	19,759 96	13,139 86
New Brunswick.....				
Prince Edward Island.....				
British Columbia.....				
Examination of masters and mates.....			908 12	1,407 66
Hudson Bay expedition.....				
Investigation into wrecks.....			140 00	
Marine Hospital, Quebec.....	19,977 36	19,221 45	21,618 73	19,823 18
Marine Hospitals.....	1,070 86	15,615 71	15,652 62	15,728 93
Meteorological service.....	8,200 00	8,950 00	8,950 00	9,370 82
Registration of Canadian shipping.....				
Removal of obstructions.....			2,350 07	1,000 00
Rewards for saving life.....				
Signal service.....				
Steamboat inspection.....	7,106 93	7,999 00	7,396 96	8,321 00
Survey, Georgian Bay.....				
Water police, Montreal.....	} 27,445 35	10,238 71	9,323 31	8,030 00
"    Quebec.....		12,633 59	9,038 62	9,379 73
Civil Government.....	15,083 88	18,064 25	19,401 05	20,220 96
Steam communication—				
Between Quebec and Maritime Provinces.....				
Between Prince Edward Island and mainland.....				
Purchase of steamers to replace—				
<i>Glendon</i> .....				
<i>Lady Head</i> .....				
Winter mail service, Prince Edward Island..				
Tidal observations.....				
Gratuities.....				
Survey, Burrard Inlet.....				
Export cattle trade.....				
	371,070 56	360,899 90	36,212 91	389,537 12



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from confederation to March 31, 1909.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
57,609 16	61,036 47	60,798 75	71,937 18	68,344 18	65,421 00	73,175 11	74,587 78	65,518 61
22,369 00	31,143 14	20,939 13	15,000 00	12,999 48	15,998 00	15,996 00	14,917 95	16,523 88
41,936 00	65,645 00	102,056 09	110,362 00	98,792 93	89,980 41	96,904 00	93,178 61	96,703 87
67,806 24	100,953 80	114,711 91	114,344 51	143,125 56	128,496 00	132,888 95	120,951 33	116,189 60
23,369 12	29,266 85	53,439 04	60,119 02	62,551 61	50,998 00	58,989 00	57,499 02	61,252 82
.....	.....	3,357 71	12,584 64	13,730 53	11,817 00	16,986 66	12,158 72	15,288 17
.....	13,207 09	18,519 50	15,983 72	17,175 97	15,853 00	18,948 78	15,152 73	15,576 99
6,940 45	18,999 38	24,461 86	14,286 65	13,320 40	16,267 98	7,207 96	11,993 75	13,297 81
57,818 35	39,303 87	41,950 82	19,325 00	24,336 47	12,945 29	12,776 47	4,154 58	7,797 75
34,760 12	90,181 79	51,867 94	43,898 63	42,214 55	25,550 00	13,500 00	17,386 97	7,069 01
9,561 14	16,691 06	31,572 60	8,842 97	17,819 85	7,083 82	12,028 13	22,598 14	4,985 53
.....	.....	.....	11,829 61	17,752 00	2,504 47	2,560 88	6,074 50	.....
.....	.....	4,353 93	8,799 07	8,477 67	29 66	.....	.....	.....
47,500 00	51,758 05	64,490 00	79,043 70	62,971 49	49,987 66	42,683 00	44,972 79	49,318 93
20,999 63	24,999 57	30,008 99	22 992 62	133,826 08	38,739 39	43,027 00	42,016 53	49,438 93
.....	.....	.....	.....	16,241 26	61,782 63	28,933 63	16,332 05	14,429 52
12,115 96	15,984 72	10,555 67	41,796 74	10,156 56	16,095 90	12,193 40	7,460 68	9,733 34
4,312 07	6,466 18	4,520 19	5,696 62	4,672 08	4,050 00	4,249 76	4,250 12	4,253 43
.....	.....	.....	.....	.....	.....	.....	.....	.....
874 00	1,068 89	2,313 31	366 00	466 41	342 65	500 00	1,691 00	676 73
21,000 00	21,000 00	20,456 45	21,994 75	23,795 85	19,965 97	19,987 50	20,791 77	12,991 23
53,536 16	27,150 43	45,986 87	37,111 67	37,155 72	42,449 55	37,487 10	37,445 57	35,040 00
12,618 15	18,830 54	36,700 59	33,580 00	45,560 03	44,871 38	46,050 24	45,706 13	45,554 51
.....	.....	272 30	1,096 46	412 06	842 14	1,435 10	239 26	257 75
.....	.....	.....	450 00	.....	203 00	462 00	305 86	825 00
2,284 32	1,975 13	4,931 78	3,552 86	2,292 20	1,958 55	4,071 00	2,533 10	2,263 15
.....	.....	1,000 00	.....	.....	.....	.....	.....	.....
8,500 00	13,266 00	10,291 68	12,200 00	13,081 86	13,073 01	13,228 38	13,076 46	11,854 34
.....	.....	.....	.....	.....	.....	.....	.....	.....
10,000 00	14,453 87	12,370 86	13,395 00	14,090 00	13,524 29	14,062 00	13,462 74	13,131 06
10,348 00	18,200 00	26,526 66	24,500 00	27,136 68	21,482 08	23,498 06	23,023 26	22,094 48
22,644 52	25,336 04	30,087 23	31,328 16	32,789 18	32,304 12	32,682 05	36,610 19	35,033 95
.....	.....	15,000 00	10,000 00	10,000 00	.....	.....	.....	.....
.....	.....	.....	.....	766 00	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
518,958 49	706,817 92	845,150 90	844,586 09	970,146 27	820,054 38	786,156 23	755,359 47	723,390 89



STATEMENT of expenditure by the Marine Department

	1881.	1882.	1883.
	\$ cts.	\$ cts.	\$ cts.
Maintenance of Lights—			
Above Montreal. ....	65,541 21	71,048 50	70,116 68
Montreal district. ....	14,326 36	21,643 05	22,260 32
Below Quebec. ....	89,781 29	91,098 66	102,784 99
Nova Scotia. ....	128,918 59	137,846 15	150,793 17
New Brunswick. ....	63,921 90	66,073 00	75,946 92
Prince Edward Island. ....	12,997 36	16,385 72	17,907 27
British Columbia. ....	17,570 72	17,803 00	18,349 06
Cape Race. ....			
Construction—			
Above Montreal. ....	14,180 02	13,581 00	9,782 27
Quebec. ....	7,539 76	3,731 31	9,672 55
Nova Scotia. ....	7,757 52	13,355 00	9,422 70
New Brunswick. ....	4,578 52	2,253 80	1,022 57
Prince Edward Island. ....	8,150 06	3,092 00	1,934 49
British Columbia. ....	8,655 39	3,237 90	1,005 26
King's Printer. ....			
Dominion Steamers—			
Quebec. ....	64,973 00	44,923 98	45,156 13
Nova Scotia. ....	36,700 00	31,049 74	37,841 07
New Brunswick. ....			
Prince Edward Island. ....	15,139 95	23,911 97	19,680 00
British Columbia. ....	11,788 09	8,504 61	25,484 00
Department. ....			
Examination of masters and mates. ....	3,888 41	3,981 00	4,021 20
Hudson's Bay Expedition. ....			
Investigation into wrecks. ....	310 48	863 19	875 64
Marine hospital, Quebec. ....	19,964 33	19,938 12	19,998 53
Marine hospitals. ....	32,218 94	33,162 45	29,880 78
Meteorological service. ....	46,163 54	47,464 07	51,990 25
Registration of Canadian shipping. ....	607 43	2,013 28	168 84
Removal of obstruction. ....	150 00	1,116 51	35 80
Reward for saving life. ....	1,806 13	2,212 00	2,534 00
Signal service. ....			3,365 33
Steamboat inspection. ....	12,211 65	14,835 00	16,209 00
Hydrographic surveys. ....			77 81
Water Police, Montreal. ....	21,953 26	21,994 74	15,798 24
Water Police, Quebec. ....	13,497 81	20,221 82	22,520 41
Civil Government. ....	36,447 50	36,789 46	37,988 39
Steam communication—			
Between Quebec and Maritime Provinces. ....			
Between Prince Edward Island and mainland. ....			
Repairs to wharfs. ....			
Purchase of steamers to replace—			
<i>Stanley</i> . ....			399 55
<i>Glendon</i> . ....			
<i>Lady Head</i> . ....			
Winter mail service, Prince Edward Island. ....			
Tidal observations. ....			
Gratuities. ....			
Survey, Burrard inlet. ....			
Export cattle trade. ....			
Survey, Bay of Quinté. ....			
Relief of distressed Canadians. ....			
Manning ships. ....			
Widow of late A. Warren. ....			
McDonald Bros. ....			
Parliamentary returns. ....			
Investigating effect of Chicago drainage canal. ....			
John McDonald. ....			
Longitude, Montreal. ....			
Marine biological station. ....			
	761,730 62	774,831 53	825,010 82



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from confederation to March 31, 1909—*Continued.*

1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
70,788 27	70,697 89	85,713 98	75,690 74	85,588 70	72,721 23	84,035 65	93,180 72
22,946 43	23,262 94	33,289 28	16,735 49	17,510 17	12,285 79	118,750 70	122,741 89
101,302 35	118,856 94	131,095 29	131,540 80	108,278 67	112,690 20		
142,909 72	137,439 40	143,153 24	117,708 53	133,009 92	140,197 15	139,459 56	139,916 83
86,670 70	92,130 28	76,046 63	96,425 28	73,465 49	78,285 79	61,608 91	61,089 31
19,059 92	20,218 83	22,282 52	17,852 13	14,796 62	19,118 51	16,968 80	19,000 46
18,107 54	15,497 76	15,783 75	16,230 43	19,604 63	16,877 12	16,411 49	19,595 22
			4,453 25	5,124 20	7,358 01		
18,432 63	27,977 42	36,678 16	18,383 20	6,341 97	8,623 76		9,796 28
3,168 48	4,354 87	5,877 84	1,260 00	2,287 86	12,203 06		3,723 14
12,489 35	4,352 42	5,905 17	5,330 89	5,533 48	6,039 91		4,596 94
2,868 70	7,667 42	2,421 66	5,280 75	1,542 61	2,966 36	23,863 09	208 16
2,158 60	879 40		384 60				410 00
2,830 38	5,223 11	4,942 70	321 84	5,918 00	1,890 00		14,417 25
			26 58		40 14		
43,019 13	51,092 98	51,485 03	50,714 52				
27,726 60	42,921 27	30,283 27	32,287 10				
		24,633 26	14,337 23				
19,539 52	33,962 54	20,927 58	19,987 67	150,659 19	126,629 33	114,956 20	111,437 03
16,111 83	12,485 07	13,430 69	10,809 07				
			13,288 83				
5,580 79	6,656 44	5,239 28	4,858 98	5,063 96	4,381 04	4,177 83	4,255 24
480 69	71,374 69	35,217 10	14,762 61	165 00			
830 12	385 15	592 63	520 14	513 91	516 67	888 94	1,172 77
19,990 34	19,996 68	16,047 95	19,706 96	18,777 62	18,643 14	10,279 08	751 75
31,401 30	45,371 29	32,229 02	32,545 35	30,667 67	33,689 20	31,450 03	33,303 37
56,418 16	56,625 40	56,898 33	57,140 74	59,986 10	58,577 07	58,452 10	62,457 10
189 27	237 88	157 13	233 13	897 02	179 21	647 52	1,207 07
342 76	2,259 21	1,237 34	4,190 83	2,500 94	3,603 65	5,737 26	3,633 65
2,614 91	5,221 15	8,147 22	7,363 94	6,825 48	5,503 44	8,150 92	4,952 20
6,704 17	3,881 05	4,622 00	5,082 17	4,441 59	5,092 54	4,976 80	4,700 79
21,893 28	23,235 04	21,775 57	22,847 57	21,430 45	22,213 03	20,989 52	22,183 76
26,745 54	20,454 68	17,759 36	21,592 55	19,424 14	17,808 46	17,969 23	17,677 51
19,021 93	17,683 59	20,933 75	17,413 47	18,725 95	16,948 82	13,164 00	573 80
22,958 79	20,399 33	22,922 82	22,935 65	18,553 57	14,698 68	8,620 61	7,279 85
38,775 00	29,900 83	30,453 57	37,193 62	32,728 78	43,501 36	42,835 78	42,253 67
					133,505 60		
56,164 71	47,238 03						
		5,985 42	6,312 93				
				7,740 25	1,842 47	2,752 67	7,012 70
						244 75	1,888 71
					200 00	80 00	1,025 00
							1,690 12
							520 85



STATEMENT of expenditure by the Marine Department

	1892.	1893.	1894.	1895.	1896.	1897.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Maintenance of lights—						
Above Montreal.....	87,033 61	87,598 15	78,090 69	82,541 16	82,256 28	80,961 06
Montreal District.....						
Below Quebec.....	116,531 27	120,404 19	124,348 80	124,763 81	124,143 66	126,186 00
Nova Scotia.....	148,815 26	150,445 26	137,339 73	140,977 53	123,234 65	124,671 19
New Brunswick.....	66,886 69	71,079 46	59,917 96	69,654 46	63,018 64	56,871 02
Prince Edward Island...	17,069 98	16,819 64	15,569 39	17,976 67	17,988 15	16,429 23
British Columbia...	26,858 68	24,413 27	27,240 77	21,734 18	24,770 44	25,679 52
General account.....						
Construction—						
Above Montreal.....	21,704 05	8,766 62	12,581 15	2,699 40	11,993 84	9,527 94
Quebec.....	809 27	10,097 18	4,743 13	3,004 14	3,300 30	296 26
Nova Scotia.....	1,965 16	4,381 24	3,104 77	4,737 03	1,842 94	61 71
New Brunswick.....	1,845 35	1,271 15	115 45	1,597 80	200 00	1 60
Prince Edward.....	1 56	2,958 61	1,604 00			452 90
British Columbia.....	9,478 81		6,356 43	180 83	225 50	569 99
Lake St. Peter.....						
New Dredge.....						
Dominion Steamers—						
Quebec.....	145,899 61	163,097 46	178,183 97	169,661 64	145,315 28	136,940 11
Nova Scotia.....						
New Brunswick.....						
Prince Edward Island.....						
British Columbia.....						
Naval Schools.....						
Examinations of masters						
and mates.....	6,363 88	4,116 99	3,745 33	2,757 29	4,062 82	3,536 29
Hudson's Bay expedition..						19,091 32
Investigation into wrecks..	603 21	643 49	850 81	351 15	483 98	565 25
Lighthouse depot, Georgian						
Bay.....						
Marine Hospitals.....	34,106 83	35,757 07	38,403 94	38,589 05	36,682 96	37,984 71
Meteorological service.....	67,138 06	61,165 60	66,440 96	64,588 34	66,600 29	67,397 71
Registration of Canadian						
shipping.....	462 59	1,476 19	394 00	207 40	517 60	531 55
Removal of obstructions...	2,878 68	1,554 53	202 02	2,217 36	456 38	631 86
Rewards for saving life....	6,398 93	7,432 64	8,014 67	6,591 34	8,004 38	5,955 19
Signal service.....	5,014 42	5,040 58	4,668 93	5,311 54	5,338 76	5,986 12
Steamboat inspection.....	22,736 59	24,386 95	25,961 36	26,385 88	26,321 27	26,837 83
Hydrographic surveys.....	16,451 10	17,542 11	31,461 76	12,653 28	15,099 63	12,352 99
Ship channel.....	6,161 60	5,436 23				
Civil Government.....	43,195 31	56,477 23	54,988 88	71,373 82		74,801 37
Repairs to wharfs.....		84 90	1,007 67	824 38	2,644 69	1,795 56
Purchase of steamer <i>Minto</i>						
Winter mail service, P.E.I.	3,309 44	4,376 96	6,497 03	6,138 18	7,779 69	21,931 05
Tidal observations.....	711 59	5,099 17	10,172 61	11,507 24	9,627 45	13,166 20
Gratuities.....			3,261 32			
Survey, Burrard Inlet.....	2,580 45					
Export cattle trade.....	1,411 57	1,711 73	1,350 83	2,268 74	2,887 24	
Survey, Bay of Quinté.....		2,085 45				
Relief of distressed Cana-				7 30		
dians.....						
Parliamentary returns.....					291 08	
Investigation effect Chica-						
go grain canal.....					2,500 00	
John MacDonald.....					200 00	
Unforeseen expenses.....						
Marine biological station..						
New life-saving station,						
Long Point.....						
Salaries, temporary clerks..						
Steamer to replace <i>Bayfield</i>						
Observatory, Sulphur Mtn.						
Charles Morrison.....						
Montreal Pilotage Commis-						
sioners.....						
Montreal wireless tele-						
graphy.....						



SESSIONAL PAPER No. 21

from confederation to March 31, 1909—Continued.

1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
87,841 22	92,751 23	82,810 92	93,708 16	92,195 52	117,896 37	154,194 26	244,960 38
.....	136,134 79	122,112 42	132,147 88	154,839 06	148,302 34	170,554 10	273,865 74
116,279 88	.....	.....	.....	.....	.....	.....	.....
126,336 00	65,072 35	122,414 86	142,359 01	149,572 14	142,725 69	164,339 92	204,157 27
67,369 98	128,674 15	52,491 93	65,247 80	69,133 51	73,410 65	79,464 50	121,289 44
18,112 93	20,569 81	42,878 40	28,031 85	24,223 73	25,575 33	25,603 09	36,760 32
26,862 03	29,530 20	33,545 95	31,938 25	35,119 03	35,758 43	39,068 34	55,976 59
.....	.....	.....	.....	46 75	.....	.....	.....
6,867 69	3,729 62	7,094 64	12,499 99	158,714 09	399,487 73	540,675 07	1,447,202 77
3,649 90	37,838 80	40,319 03	17,060 13				
4,067 99	3,123 16	4,884 22	12,832 69				
1,423 34	91 49	.....	266 34				
1,409 60	616 96	5,586 91	922 00				
6,414 19	19,305 60	.....	4,160 74				
.....	.....	.....	660 03	.....	.....	.....	93,938 90
.....	.....	.....	.....	.....	.....	.....	10,745 36
.....	.....	.....	.....	.....	.....	.....	.....
117,644 39	145,270 75	180,430 65	195,484 75	452,526 92	369,813 97	306,171 01	475,907 20
.....	.....	.....	.....	.....	.....	6,106 54	3,123 24
.....	.....	.....	.....	.....	.....	.....	.....
3,335 40	3,568 26	3,750 69	3,730 25	3,305 59	4,968 36	7,761 17	5,884 74
27,050 66	.....	.....	.....	.....	.....	178,638 94	236,469 00
312 77	982 17	773 06	1,022 65	1,824 55	1,367 45	3,570 28	5,111 34
.....	.....	.....	.....	.....	.....	.....	12,000 00
38,162 56	37,353 29	37,743 30	36,008 75	51,827 13	48,750 15	50,301 78	51,731 56
64,135 71	73,148 05	76,692 42	74,082 76	80,147 46	87,293 00	90,306 99	98,820 21
.....	.....	.....	.....	.....	.....	.....	.....
818 33	966 48	266 43	546 62	607 23	417 25	1,203 56	1,215 14
704 17	745 49	252 19	1,000 00	1,325 25	682 98	752 60	9,521 68
5,081 40	7,049 09	7,007 97	8,519 92	8,278 55	9,306 25	11,763 12	9,592 91
4,993 88	6,067 90	5,906 83	8,950 17	6,452 56	6,863 75	7,740 01	8,755 44
26,342 29	28,035 49	72,965 72	29,247 59	27,493 80	30,172 09	33,723 12	50,187 75
15,306 66	13,664 97	12,600 98	16,170 20	25,488 64	35,243 97	41,366 95	103,926 98
.....	.....	.....	.....	.....	.....	.....	511,171 41
74,644 05	72,833 97	63,331 61	68,776 95	70,246 32	84,442 53	91,985 07	102,735 31
1,618 97	.....	697 87	1,261 06	2,824 28	1,721 91	1,300 89	1,590 61
.....	144,365 29	41,951 88	.....	.....	.....	.....	.....
9,575 31	8,439 70	1,503 70	2,093 93	8,835 86	6,211 28	8,912 57	10,984 74
3,081 45	5,186 35	4,372 18	7,060 20	8,925 33	14,520 00	21,871 71	23,802 24
.....	.....	.....	.....	136 85	1,050 00	1,210 00	2,340 00
.....	.....	.....	.....	.....	.....	.....	.....
2,499 80	2,737 85	2,762 24	2,746 84	3,321 23	3,026 25	3,504 43	3,300 35
.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	133 32	.....	95 10	.....	269 20
.....	.....	.....	1,659 14	.....	.....	.....	.....
.....	.....	3,452 21	2,630 62	3,490 29	4,822 78	3,977 63	2,953 19
.....	5,709 10	739 61	1,990 58	1,998 85	2,000 00	2,996 54	2,001 69
.....	.....	.....	.....	1,780 52	.....	.....	.....
.....	.....	.....	.....	2,967 35	6,945 96	11,448 10	15,881 35
.....	.....	.....	.....	50,000 00	.....	.....	.....
.....	.....	.....	.....	55 00	3,167 62	.....	.....
.....	.....	.....	.....	223 00	.....	.....	.....
.....	.....	.....	.....	3,691 69	.....	.....	.....
.....	.....	.....	.....	.....	1,745 23	2,050 00	10,776 51



1 GEORGE V., A. 1911

STATEMENT of expenditure by the Marine Department

	1892.	1893.	1894.	1895.	1896.	1897.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Purchase land for wharf at Halifax, N.S.....						
Purchase land for wharf at Charlottetown, P.E.I....						
Schools for navigation.....						
Naval Militia.....						
Cattle inspection.....						
Wrecking plant.....						
Ice breaking steamers .....						
S. Shaw.....						
Salaries, light keepers.....						
Agencies, rents, &c .....						
Maintenance and repairs..						
Repairs to lightships.....						
Construction and apparatus						
	861,426 80	898,720 03	905,654 34	895,828 28	793,634 49	867,772 90



SESSIONAL PAPER No. 21

from confederation to March 31, 1909—*Continued.*

1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.
\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
.....	.....	.....	.....	.....	3,528 25	18,847 31	40,785 10
.....	.....	.....	.....	.....	.....	15,119 11	.....
.....	.....	.....	.....	.....	.....	13,000 00	.....
.....	.....	.....	.....	.....	.....	5,036 29	.....
.....	.....	.....	.....	.....	.....	9,135 87	.....
.....	.....	.....	.....	.....	.....	3,335 52	.....
.....	.....	.....	.....	.....	.....	25,000 00	.....
.....	.....	.....	.....	.....	.....	164,414 93	.....
.....	.....	.....	.....	.....	.....	39 33	.....
.....	.....	.....	.....	.....	.....	242,403 64	.....
.....	.....	.....	.....	.....	.....	29,739 50	.....
.....	.....	.....	.....	.....	.....	531,920 43	.....
.....	.....	.....	.....	.....	.....	23,560 00	.....
.....	.....	.....	.....	.....	.....	1,605,778 59	.....
856,192 50	1,102,601 90	982,561 97	1,029,925 32	1,501,618 88	1,671,494 77	2,150,940 31	4,747,722 81



S9(TEMENT of expenditure by Marine Department from confederation to March 31, 1909—Continued.

	1906.
	\$ cts.
Dominion steamers—	
Quebec.....	587,885 89
Nova Scotia.....	
New Brunswick.....	
Prince Edward Island.....	
British Columbia.....	
Examination of masters and mates.....	7,068 15
Hudson's Bay expedition.....	132,707 52
Investigation into wrecks.....	7,476 07
Marine hospital.....	50,120 42
Meteorological service.....	99,719 52
Registration of Canadian shipping.....	1,800 00
Removal of obstructions.....	4,967 15
Rewards for saving life.....	11,991 43
Signal service.....	8,194 39
Steamboat inspection.....	37,590 22
Hydrographic surveys.....	120,359 68
Ship channel.....	587,957 51
Repairs to wharfs.....	2,960 47
Winter mail service, Prince Edward Island.....	16,680 58
Tidal observations.....	28,047 77
Unforeseen expenses.....	3,765 17
Marine biological station.....	2,914 03
Salaries, temporary clerks.....	19,947 01
Purchase land for wharf at Halifax, N.S.....	88,032 87
Schools for navigation.....	5,036 29
Naval militia.....	9,135 87
Cattle inspection.....	3,335 52
Wrecking plant.....	25,000 00
Ice-breaking steamers.....	161,414 93
S. Shaw.....	39 23
Salaries, lightkeepers.....	242,403 64
Agencies, rents, &c.....	29,739 50
Maintenance and repairs.....	531,920 43
Repairs to lightships.....	33,560 00
Construction and apparatus.....	1,605,778 59
Submarine signal apparatus.....	50,547 60
Administration of pilotage.....	12,066 42
Parry Sound Buoy Depot.....	11,711 17
Compensation re explosion of gas buoys.....	38,686 49
Water system, Partridge Island.....	2,957 37
Observatory, Toronto.....	2,872 96
" Montreal.....	500 00
Hydrographic steamer, Atlantic coast.....	45,500 00
" " Pacific coast.....	370 01
New dredge No. 15.....	150,001 32
" Galveston.....	159,847 89
Shipwrecked and distressed seamen.....	598 81
Parliamentary returns.....	485 11
Gratuities.....	616 66
Civil Government, salaries.....	88,453 31
" " contingencies.....	19,506 45
	5,066,252 66



SESSIONAL PAPER No. 21

STATEMENT of expenditure by Marine Department from confederation to March 31,  
1909—*Continued*.

Service.	Amount.	Total. 1907.
	\$ cts.	\$ cts.
Ocean and river—		
Dominion steamers.....	447,139 03	
Examination of masters and mates.....	5,934 16	
Rewards for saving life—life-boats, &c.....	9,025 89	
Investigations into wrecks.....	8,662 16	
Schools for navigation.....	4,891 69	
Registration of Canadian shipping.....	1,506 53	
Removal of obstructions in navigable waters.....	7,377 20	
Tidal service.....	19,214 79	
Marine biological stations.....	11,998 01	
Cattle inspection.....	1,537 04	
Wrecking plant.....	2,743 80	
Wrecking plant.....	15,000 00	
Hudson's Bay expedition.....	33,871 95	
" " patrol boat.....	29,977 91	
Ice-breaking steamer <i>Lady Grey</i> .....	66,293 51	
Quebec Coal Company's claim.....	1,000 00	
Arresting two sailors of the <i>Hector</i> .....	148 75	
H. M. Stewart, clothing destroyed by fire.....	171 00	
Unforeseen expenses.....	3,213 62	669,717 04
Lighthouse and coast—		
Salaries and allowances of lightkeepers.....	197,235 03	
Agencies, rents and contingencies.....	22,076 58	
Maintenance and repairs to lighthouses.....	499,597 86	
Contruction of lighthouses and apparatus.....	1,159,906 40	
Breaking ice in Thunder Bay.....	21,303 85	
Signal service.....	6,859 68	
Marconi stations.....	53,532 19	
Pilotage.....	21,490 73	
Repairs to wharfs.....	1,747 15	
Salaries, temporary clerks.....	14,477 16	
Georgian Bay and Parry Sound buoys.....	4,500 43	2,002,727 06
Scientific institutions and hydrographic surveys—		
Observatory, Toronto.....	2,313 67	
" Kingston.....	375 00	
" Montreal.....	375 00	
Meteorological service.....	75,163 20	
Hydrographic surveys.....	84,435 32	161,662 19
Dredge No 15 .....		150,000 00
Cap à la Roche.....		1,347 87
<i>Galveston</i> .....		50,089 77
Ship channel.....		419,398 19
Compensation to L. O'Brien.....		2,200 00
Marine hospitals.....	37,362 11	
Shipwrecked and distressed seamen.....	793 56	38,156 67
Steamboat inspection.....		32,459 55
Returns for Parliament.....	634 36	
K. Falconer, reorganizing system of bookkeeping.....	25,000 00	25,634 36
Civil Government, salaries.....	68,995 81	
" " contingencies.....	14,182 31	83,178 12
Total, Marine Branch.....		3,637,569 82
" Fisheries Branch.....		534,669 90
Fishing bounty.....		159,015 75
		4,331,255 47



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STATEMENT of expenditure by Marine Department from confederation to March 31, 1909—Continued.

	Amount.	Total, 1908.
<i>Ocean and River Service—</i>		
Dominion steamers and ice-breakers.....	\$669,428 59	
Examination of masters and mates.....	11,508 31	
Rewards for saving life.....	31,642 41	
Investigations into wrecks .....	6,543 08	
Schools of navigation.. ..	7,378 07	
Registration of shipping .....	1,982 70	
Removal of obstructions .....	26,009 59	
Tidal service.....	30,977 40	
Winter mail service.....	11,019 79	
Cattle inspection.....	3,503 90	
Wrecking plants.....	30,000 00	
Unforeseen expenses.....	1,301 61	
Naval militia.....	9,078 17	
Patrolling waters in northern portion of Canada.....	34,706 49	
New ice-breaking steamer.....	5,974 61	
Returns to Parliament.....		
		\$881,054 56
<i>Public Works—Chargeable to Capital—</i>		
Ship channel.....	\$761,916 84	
Permanent piers in Lake St. Peter, &c.....	116,063 87	
Dredging, Cap à la Roche.....	75,000 00	
Dredge, Beaujeu.....	100,000 00	
Spur line, Sorel shipyard.....	8,815 05	
Montreal and Quebec Signal Service.....	12,232 15	
		\$1,074,027 91
<i>Lighthouse and Coast Service—</i>		
Agencies, rents and contingencies.....	\$ 29,359 26	
Salaries and allowance to lightkeepers.. ..	285,050 14	
Maintenance and repairs to lighthouses.....	689,319 86	
Parry Sound buoy depot.....	41,983 93	
Construction of lighthouses, &c.....	715,572 91	
Construction of apparatus.....	801,626 83	
Wireless stations.....	114,986 60	
Signal service.....	79,350 28	
Administration of pilotage.....	31,087 22	
Maintenance and repairs to wharfs, &c.....	1,456 86	
Maintenance and upkeep of dock yards.....	30,656 22	
Breaking ice, Lake Superior, &c.....	37,053 32	
Salaries of temporary clerks, &c.....	16,728 99	
Telephone reporting stations below Montreal.....	7,820 68	
Steamer for the Great Lakes.....		
Service of expert accountants.....	13,066 34	
Charter of steamer, Lime Kiln Crossing.....	6,650 00	
Keeping lights on 'Castle' and 'Arminia'.....	3,680 00	
		\$2,835,459 44
<i>Scientific Institutions and Hydrographic Surveys—</i>		
Meteorological service.....	\$122,572 86	
Magnetic observatory.....	2,918 20	
Montreal observatory.....	500 00	
Kingston observatory.....	500 00	
Hydrographic surveys.....	115,631 31	
Hydrographic survey steamer for B.C.....	107,250 00	
		\$349,373 37
Marine hospital.....	\$ 59,957 92	
Shipwrecked and distressed seamen .....	342 25	
Marine hospital at Yarmouth, N.S .....	7,285 00	
		67,585 17
Steamboat inspection.....	\$ 42,210 43	
<i>Fisheries.....</i>		
		800,081 73
Civil Government Salaries, Marine and Fisheries.....	103,916 53	
Contingencies of Marine and Fisheries.....	21,146 77	
		125,063 30
Total expenditure Marine and Fisheries.....		\$6,174,855 91
Fishing bounty.....		156,114 50

Expenditure for 1908-9 is Appendix No. 5 in this report to be added to statement of expenditure since confederation.



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## APPENDIX No. 8.

## HYDROGRAPHIC SURVEY.

July 26, 1910.

The Deputy Minister,  
Department of Marine and Fisheries,  
Ottawa.

SIR,—I beg to respectfully present the following report upon the work of the Hydrographic Survey during the season 1909-10.

The staff, as last year, was divided into five parties, as follows:—

- I. One on the Great Lakes;
- II. One on the lower St. Lawrence;
- III. One on the Pacific coast;
- IV. One in Nova Scotia; and
- V. One on Lake of Two Mountains.

First: The party on the Great Lakes was in charge of Captain F. Anderson, who had for assistants, Messrs. Bachand, Fraser and Lighthall, and used the twin-screw steamer *Bayfield*.

During the winter of 1909 the Honourable the Minister desired to discontinue work on Lake Superior for the present, and to undertake the resurvey of the Canadian shore of Lake Ontario. For this reason Captain Anderson and party took up their headquarters at Brighton, Ont., working along the south shore of Prince Edward county from False Ducks to Presqu'île.

The steamer *Bayfield* with full party on board left her winter quarters at Owen Sound on May 7. Advantage was taken of her trip to make much needed resurveys of Goderich and Rondeau harbours, and Ports Stanley, Burwell and Colborne, new charts of which are now in the printer's hands and will be issued this season.

The resurvey of Goderich harbour showed that there were some unknown lumps inside the new outer breakwater, and no doubt it was upon these that one or two vessels grounded during the low water of the previous autumn. The whole area between the piers and the outer breakwater was carefully swept, and no dangers beyond those marked on the new plan could be found.

A re-examination of the shoal discovered, in the summer of 1908, off the Pere Marquette car ferry dock at Sarnia, was made by sweeping, and no depth less than 21 feet could be found.

In the Detroit river near Windsor, a little below the lowest car ferry dock, a boulder spit was found to extend 400 feet off shore, with depths on it ranging from 15 to 18 feet at least water. During the previous autumn the freight vessel *John Mitchell* struck on this reef and did herself some damage.

The resurvey of Rondeau harbour, Port Stanley, Port Burwell and Port Colborne did not disclose any very serious changes, except at Port Burwell where the sandy shore silts into the dredged channel.

On June 10, the party arrived at Brighton, and took up the resurvey of Lake Ontario.

The work in any district may be divided into four parts:—

- I. Triangulation;
- II. Traversing of shore line;



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III. Boat sounding in the shallow water in which it is not safe to manœuvre the ship; and

IV. Ship sounding in the deeper water as far off shore as objects can be picked up.

Of these divisions, the triangulation must necessarily be taken up first and completed. Most of it along the south shore of Prince Edward county was done by what is termed a 'water triangulation,' or using the ship moored off shore in convenient positions for the apices of the triangles.

The traversing of the whole shore from Presqu'île to South Bay point was completed.

The sounding of the shallow water was undertaken with boats, and the portion between Presqu'île and Point Peter completed, and suspicious casts closely examined.

During the clear windy weather, when it is impossible to lower the boats, advantage is taken of the occasion to sound the deeper water from the ship's deck to make certain that no dangers exist beyond the known fringe of shallow water.

Owing to the fact that the south side of Prince Edward county is very often a lee shore, the boat sounding was very seriously interfered with, and it often happened that this same prevailing wind brought in smoke or a thick, heavy summer haze. Both of these circumstances militated against a very good showing, and considerable of the work undertaken last season was uncompleted. However, the party succeeded in traversing 72 miles of shore line; sounded 566 miles in boats and 460 miles from the ship over an area of 213 square miles.

When working in the vicinity of South Bay point, Captain Anderson was instructed to make an examination of some foul ground to the eastward of the False Ducks, and this showed that there was considerably less water on William and Harris shoals than is shown on the United States Lake Survey charts. This, taken in conjunction with several other suspicious casts that have been found in the approach to Kingston, makes it necessary to have a resurvey of that water made at an early date.

On November 3, the weather being no longer suitable for economical work on the lake, the steamer was laid up at the lighthouse depot at Prescott, and the crew discharged. I am pleased to be able to report that the steamer has been well looked after, and considering her age is in excellent condition.

*Lower St. Lawrence or Atlantic Coast Survey.*—Lieutenant I. B. Miles, R.N., assisted by Messrs. C. Savary, G. C. Venn and H. Ortiz, on board *La Canadienne*, has been engaged as in former years in the survey of the lower St. Lawrence. The work during the past season was carried on in the river opposite Bic and Green islands.

Very good progress was made with the work, although greatly hampered by strong winds, haze and smoke.

During the season the party traversed 70 miles of shore line; sounded 800 miles in small boats and launches, and 950 miles from the steamer, over an area of 217 square miles.

I am happy to say that no really dangerous ground was discovered in the area examined, but the survey has made a much better determination of the shallow anchorages banks and previously known dangers.

Upon Captain Miles' arrival at Quebec, he was instructed to proceed to Matane and examine the ground there for a danger which the *Empress of Ireland* was reported to have struck.

A very careful examination was made over quite a large area in the neighbourhood of the position given for the grounding, and this showed that there was no shoal upon which she could have struck except the Roix shoal, shown upon the latest editions of chart No. 307 but not upon the chart used by the *Empress of Ireland*.

Captain Miles also noticed some slight inaccuracies in the chart, all of which shows that the survey of that and other portions of the river cannot be undertaken any too soon.



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He reports that whilst at work on the shoal two large ocean steamers passed between him and the shore, and considered that these vessels were not being navigated with all possible care, as the shoal is unbuoyed and uncharted on the older editions of the chart.

It has been found that *La Canadienne* was unable to steam directly across the river during spring tides, and on this account a good deal of time was lost. Upon the matter being brought to the attention of the minister, he was good enough to ask parliament for an appropriation for a more suitable vessel, and in July, 1909, a contract was entered into with Swan Hunter and Wigham Richardson, of Wallsend-on-Tyne, England, for the construction of a vessel from designs prepared in this office by Mr. R. L. Newman, of Victoria, B.C. I am happy to say that such good progress has been made with the construction, that the vessel will be available for service in 1910.

On November 2, *La Canadienne* returned to Quebec, and the crew was discharged.

*Pacific Coast Branch.*—This branch of the survey was in charge of Captain P. C. Musgrave, who had for assistants Messrs. H. D. Parizeau, F. P. V. Cowley and L. R. Davies. The work was performed on board the steamer *Lillooet*, the party leaving Esquimalt on March 24.

The first work undertaken was a resurvey of Boat harbour, on the east coast of Vancouver island, where new coal chutes were being erected. The work showed that an uncharted shoal existed in the approach, and this was afterwards buoyed by the agent of the department.

A new photolithographed chart, embodying the information gathered in this survey, has been issued to the public.

The work in this harbour was completed on April 7, and the party left to resume its station in the vicinity of Prince Rupert, B.C., where the *Lillooet* arrived on the 14th.

Work was taken up in the vicinity of Lucy and Rachel islands to fill up small gaps that were overlooked in the previous season. Whilst examining Alexandra patch (a shoal lying between the above-mentioned islands) a new rock, with least water of 11 feet on it, was discovered. Previous to the survey it was generally supposed that not less than 10 fathoms existed here, so that such discoveries show the absolute necessity of very careful examinations of all suspicious casts and inequalities of the bottom.

The party here was divided in two, the smaller being placed in camp at Claxton under Mr. Parizeau, assisted by Mr. Cowley. These officers were detailed to survey Telegraph passage, part of the entrance to Skeena river, and Arthur passage lying to the westward of Kennedy island. I am pleased to report that the work in the former two channels was completed and the triangulation of Arthur passage sufficiently advanced to make ready for sounding during the coming season.

Captain Musgrave with the steamer undertook the sounding of a large area lying between the northeast point of Queen Charlotte islands and the southeast extreme of Prince of Wales island in the easterly approach to Dixon entrance. This area was unavoidably left unsurveyed by Captain Parry of H.M.S. *Egeria* in the season of 1908, and this survey was asked to complete it. I have to report that although no dangerous water was discovered the work proved very difficult because all of the land objects were at great distances, and the only points visible were mountain peaks that were too often hidden in the clouds, causing much inconvenience and loss of time.

Toward the latter end of the autumn a preliminary examination was made of the channel joining Masset inlet with Dixon entrance, and it was found that although the currents were very strong, there was plenty of water to proceed to the inlet.

On the morning of August 26, 1909, the steamer *Ohio*, en route from Seattle to Valdez, Alaska, struck an uncharted rock off Steep point in Heikish narrows. Captain



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Musgrave was instructed to stop at this place on his way to Victoria and make an examination. He reported that upon examination he found the old chart quite inaccurate, and that the danger was 350 feet from Sarah island, so that if the *Ohio* had not been hugging the shore too closely she would have passed clear.

The party reached Victoria on November 8. The crew was immediately paid off, and the ship placed in winter quarters.

During the season this party succeeded in traversing 42 miles of shore line, sounded 350 miles in the boats and 380 miles from the ship, and covered an area of 270 square miles.

I regret to say that the weather in the vicinity of Prince Rupert and Queen Charlotte islands is anything but favourable for economical surveying, as the parties are not able to work on an average of more than two days per week on account of wind, rain and fog.

*The Nova Scotia Party.*—This party, living ashore, was placed in charge of Mr. Charles McGreevy, assisted by Messrs. Jobin and Jodoin.

The first work undertaken was the completion of the survey of Cumberland basin, started in the season of 1909. For this purpose a launch was used, and the work completed on July 20.

At the request of various interested parties, the minister ordered this party to be placed in Tatamagouche bay to make a careful examination of the shores with the view of selecting the best locality for wharfs and piers. This work was completed before the end of the season, and the party returned to Ottawa on November 11.

This party traversed 32 miles of shore line and sounded 250 miles over an area of 11 square miles. The small area in this case is accounted for by the fact that the sounding was of a much closer nature than is usual in hydrographic surveys.

*Lake of Two Mountains Survey.*—This party, under Mr. A. J. Pinet, assisted by Messrs. St. Pierre and Ghysens, left winter quarters in Montreal on May 15, and spent the whole season on the lake, but were not quite able to complete it.

They succeeded in traversing 25 miles of shore line, and sounding 1,260 miles, over an area of 28 square miles.

It is hoped that early in the season of 1910 that this lake will be completed, and the chart issued for use at the opening of navigation in 1911.

During the past fiscal year the following charts were issued to the public:—

- No. 99. 'Key Harbour,' Georgian bay.
- 201. 'White Island to Orignaux Point,' St. Lawrence river.
- 307. 'Middle Passage, Skeena River,' Pacific coast.
- 308. 'Boat Harbour,' Pacific coast.
- 301. 'Prince Rupert Harbour,' Pacific coast.
- 50. 'Lake St. Louis,' St. Lawrence river.
- 19. 'St. Antoine to St. Augustin,' St. Lawrence river.
- 20. 'St. Nicholas to Quebec Bridge,' St. Lawrence river.
- 22. 'Montreal to Sorel,' St. Lawrence river.
- 23. 'Sorel to Batiscan,' St. Lawrence river.
- 24. 'Batiscan to Quebec,' St. Lawrence river.
- 22A. 'Triangulation sheet of Montreal to Sorel,' St. Lawrence river.
- 23A. 'Triangulation sheet of Sorel to Batiscan,' St. Lawrence river.
- 24A. 'Triangulation sheet of Batiscan to Quebec,' St. Lawrence river.

In addition to these, second and revised editions were also issued of the following:—

- No. 7A. 'Berthierville to Lake St. Peter,' St. Lawrence river
- 10. 'Foot of Lake St. Peter,' St. Lawrence river.
- 12. 'Becancour to Champlain,' St. Lawrence river.



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13. 'Champlain to Pt. Citrouille,' St. Lawrence river.
14. 'Batiscan to Cap Levrard, St. Lawrence river.
1. 'Montreal Harbour,' St. Lawrence river.

During the year Captain Boulton, R.N., was engaged in the preparation of a set of sailing directions for the St. Lawrence river from Quebec to Kingston. This was placed in the printer's hands, and it is hoped that the book will be issued to the public before the opening of navigation of 1911.

Sailing directions of the St. Lawrence river from Razade island to Orignaux point have also been prepared, and have been put in the printer's hands.

During the past season the personnel of the staff of the survey was changed by the resignations of Messrs. A. Amos, R. Bickerdike, W. R. McGee and A. E. Humphrey; and the appointment of Messrs. G. L. Crichton, E. Ghysens and A. Lighthall.

I am, sir, your obedient servant,

WM. J. STEWART,  
*Hydrographer.*



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## APPENDIX No. 9.

## NAVAL BRANCH.

OTTAWA, April 1, 1910.

G. J. DESBARATS,

Deputy Minister, Marine and Fisheries.

SIR,—I have the honour to make the following report with regard to the Naval Department, to March 31, 1910.

1. The question of the formation of colonial navies resulted in an Imperial conference being held in London in July and August, 1909, Canada being represented by the Hon. Sir F. Borden, K.C.M.G., Minister of Militia and Defence, and the Hon. L. P. Brodeur, Minister of Marine and Fisheries. Major General Sir P. H. N. Lake, K.C.M.G., C.B., and Rear Admiral C. E. Kingsmill, accompanied the Canadian representatives as technical advisers.

2. The opinion of the conference was that, whilst it was desirable to form a fleet unit, consisting of one cruiser of the *Indomitable* type, three second-class cruisers of the *Bristol* type, six destroyers of the River class, and three submarines of the 'C' class, still Canada's double seaboard rendered the provision of a fleet unit of the same kind unsuitable for the present. It was proposed that Canada should make a start with cruisers of the *Bristol* type and destroyers of an improved River class—a part to be stationed on the Atlantic seaboard and a part on the Pacific.

3. These views met with the approval of the government, and it was decided to establish a Canadian navy, and the loan was obtained from the Admiralty of three officers to assist in the preparation of the preliminary details in connection with the organization of the Canadian navy. These officers were: Commander J. D. D. Stewart, Lieutenant (G) R. M. T. Stephens, and Staff Paymaster P. J. Ling. These officers arrived in Ottawa in October, 1909.

4. On January 12, 1910, the Hon. L. P. Brodeur being prevented by illness, the Premier introduced a Bill in the House of Commons intituled, 'An Act Respecting the Naval Service of Canada;' this Bill provided for the establishment of a Canadian navy. On March 31 this Bill was still before the House.

5. In the meantime negotiations were in progress with the Admiralty for the purchase of two cruisers, the *Niobe* and *Rainbow*, to be stationed as training ships on the Pacific and Atlantic coasts respectively.

The *Niobe* is a first-class cruiser of 11,000 tons. Length, 435 feet; beam, 69 feet; draught of water, 26 feet. Completed in 1899 at a cost of £550,000. Armament, 16 6-inch, 14 12-pounder, 5 3-pounder, and 2 machine guns. Speed, 20 knots. Complement, 705.

The *Rainbow*, a second-class cruiser, of 3,600 tons. Length, 300 feet; beam, 43 feet; draught of water, 17½ feet. Completed in 1891 at a cost of £184,000. Armament, 2, 6-inch, 6, 4.1-inch, 8, 6-pounder, 1, 3-pounder, and 4 machine guns. Speed, 19.7 knots. Complement, 273.

The Admiralty agreed to sell these vessels, the *Niobe* for £215,000 and the *Rainbow* for £50,000. The question of the purchase was deferred until the Bill was passed and the purchase of the vessels ratified by parliament. This matter had not been decided by March 31, the Bill being still before the House.

I have the honour to be, sir,

Your obedient servant,

C. E. KINGSMILL,

Rear Admiral.



## APPENDIX No. 10.

REPORT OF THE CHAIRMAN OF THE BOARD OF STEAMBOAT  
INSPECTION.

CHAIRMAN'S OFFICE, OTTAWA, June, 1910.

To the Deputy Minister of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the annual report of the Steamboat Inspection service for the fiscal year ending March 31, 1910.

It contains the work of the service during the time stated, giving the names and number of steamboats inspected in the several divisions and their gross tonnage, with the amount of dues collected from steamers employed in the carriage of passengers between Canadian ports but registered elsewhere than in Canada, and the amount of fees received for engineer examinations, with the names of the candidates and their grades of certificates.

In addition to the steamboats inspected, the ships' tackle and hoisting gear used for the loading and unloading of vessels in the ports of Halifax, St. John and Montreal were also inspected.

Number of steam vessels reported as known by the inspectors of steamboats in the Dominion for the year ending March 31, 1910; also the number of steamers inspected but not registered in the Dominion for same date:—

Division.	Number of Dominion registered steamers.	Gross tonnage of Dominion registered steamers.	Number of steamers inspected but not registered in the Dominion.	Gross tonnage of steamers inspected but not registered in the Dominion.
Toronto .....	378	122,526	51	65,059
Collingwood .....	151	46,458	20	32,011
Kingston .....	170	35,309	12	1,386
Montreal .....	209	23,053	5	13,955
Sorel .....	116	41,327	2	3,615
Quebec .....	109	18,876	10	17,027
Nova Scotia .....	166	38,565	15	36,874
New Brunswick and P. E. Island .....	156	21,573	13	20,385
Vancouver and Yukon .....	187	23,971	10	14,990
Victoria, B. C. ....	155	53,617	21	31,841
Manitoba and Northwest Provinces .....	181	15,544	3	1,084
Total .....	1,978	440,819	162	238,227



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Number of Dominion registered steamers inspected and their gross tonnage, with amount of fees collected on account of steamboat inspection, during the year ended March 31, 1910:—

Division.	Number of Dominion registered steamers inspected.	Gross tonnage of Dominion registered steamers inspected.	Amount of fees collected on account of Steamboat Inspection.
			\$ cts.
Toronto. ....	316	121,677	343 84
Collingwood . . . . .	124	44,088	45 68
Kingston . . . . .	162	34,369	.....
Montreal. ....	180	21,319	.....
Sorel. ....	109	38,362	.....
Quebec. ....	103	16,106	421 52
Nova Scotia. ....	162	39,783	1,525 36
New Brunswick and P. E. Island. ....	152	25,178	470 08
Vancouver and Yukon. ....	174	23,209	922 00
Victoria, B. C. ....	150	49,166	687 12
Manitoba and Northwest Provinces. ....	114	11,980	.....
Engineers' Certificates. ....			2,054 00
Total. ....	1,746	425,237	6,469 60

BOARD MEETINGS AND APPOINTMENTS OF INSPECTORS.

Owing to the demise of the late J. P. Esdaile, steamboat boiler and machinery inspector for Nova Scotia, a meeting of the Board was convened at Halifax, May 18, 1909, to examine candidates to fill the vacancy. Mr. N. A. Currie, of Yarmouth, N.S., having passed a qualifying examination was recommended for the position, and appointed thereto by order in council of June 21, 1909, his duties commencing from June 1.

On account of age, Mr. Joseph Samson, inspector of steamboat boilers and machinery for Quebec, was placed on the retired list. A Board meeting was convened at Ottawa, February 15, 1910, to examine Mr. Joseph Fontaine, of Lévis, to fill the vacancy. He passed a satisfactory examination, and was appointed to the position by order in council of March 1, 1910.

PROSECUTIONS AND PENALTIES ENFORCED FOR VIOLATION OF PART VII OF THE CANADA SHIPPING ACT, STEAMBOAT INSPECTION.

On August 3, 1909, the department was informed that the steamer *Otonabee*, of Peterborough, which was carrying an excursion, was overloaded, having more passengers on board than that permitted by her certificate of inspection. Evidence was submitted when action was taken before the police magistrate at Peterborough to inflict the penalty for so doing. A fine of \$100 was imposed, for which a cheque was received by the department, October 14, 1909.

On August 21, the steamer *Argyle*, of Kenora, was reported by the steamboat inspector as being overloaded with passengers, when a prosecution was entered before the police magistrate to collect the penalty for so doing. The owner was fined \$150 and costs, and a deposit receipt for same was received by the department, December 27, 1909.



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## CASUALTIES.

The following are the casualties reported from the several divisions as having occurred during the year ending March 31, 1910:—

*Toronto Division.*

April 23, 1909.—The Canadian Pacific Railway car ferry *Michigan* collided with the United States steamer *J. P. Walsh* in the Detroit river, near Windsor, Ont., whereby considerable damage was done to her hull and machinery. The necessary repairs were made at Detroit, Mich., to again put the vessel into safe and seaworthy condition.

June 28, 1909.—The steamer *John Hanlan*, of Toronto, while moored to the wharf at Toronto, was run into by the steamer *H. M. Pellatt*, whereby the *John Hanlan's* hull sustained considerable damage, and sank, but was afterwards raised and thoroughly repaired.

August 2, 1909.—SS. *Glenellah*, of Dundee, when leaving Port Colborne harbour, the steering gear became out of order, and the vessel collided with the harbour breakwater, damaging the forward part of the hull. She proceeded to Detroit, where necessary repairs were made.

August 24, 1909.—The SS. *Collingwood*, of Collingwood, collided with the United States steamer '*Geo. L. Craig*' in the Detroit river, near Windsor, Ont., and sank. She was afterwards raised, and put into seaworthy condition, going into commission again November 9.

September 4, 1909.—The car ferry *Ontario*, No. 1, of Montreal, ran ashore near Cobourg, Lake Ontario. She was released next day, and proceeded to dry dock at Kingston, where the hull was examined and repaired.

October 12, 1909.—The tug *Winnanna*, of Midland, was partly destroyed by fire at Tobermory, but is being repaired at Wiarton, Ont. Cause of fire is unknown.

November 17, 1909.—SS. *Rome*, of Port Arthur, while lying at the wharf at Lime island, Soo river, was totally destroyed by fire. Cause of fire unknown.

November 30, 1909.—Tug *Ottawa*, of Sarnia, was totally destroyed by fire while moored to the wharf at Redcliffe, Wisconsin. The fire started in forward hold from some unknown cause.

December 7, 1909.—The tug *Augusta*, of St. Catharines, was totally destroyed by fire at Port Dalhousie, which occurred at the time the steamer was being laid up for the winter. The cause is unknown, as no person was on board at the time.

*Collingwood Division.*

July 22, 1909.—The tug *Gilphie*, of Ottawa, was totally destroyed by fire near Lions Head. Cause of fire unknown. No casualties.

September 9, 1909.—The tug *Columbus*, of Sault Ste. Marie, was totally destroyed by fire at the harbour of Gargantua, Lake Superior, at about 2 a.m. Cause of fire supposed to be from the explosion of a lamp. No lives lost.

November 3, 1909.—The steam barge *Reliever*, of Midland, while loading at Methodist Point, Georgian bay, was destroyed by fire, the hull being a total loss.

November 15, 1909.—SS. *Ottawa*, of Ottawa, foundered during a heavy gale on Lake Superior, about 15 miles off Passage island, becoming a total loss, caused by the shifting of her cargo, and the steering gear becoming disabled by the shifting of the deck load. The vessel fell off into the trough of the sea, and listed to such an extent that she was abandoned, and shortly after sank in about 100 fathoms of water. No lives were lost.



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*Kingston Division.*

June 11, 1909.—Steamer *John Randall*, of Kingston, while on a trip from Kingston to Oswego broke the gib of the strap connection to crank pin, and being disabled was towed to Kingston and repaired.

August 31, 1909.—Steamer *Kathleen*, of Lindsay, while lying at Sturgeon Point wharf, was destroyed by fire caused by lightning. No fatalities.

October 14, 1909.—Steamer *Rideau King*, of Kingston, on her trip from Kingston to Smith's Falls, struck Pear island, in Mud lake, breaking several planks and frames on starboard side, whereby she filled with water and sank immediately to the main deck, breaking her steam pipe. She was afterwards raised, brought to Kingston and repaired. There was no person injured.

*Montreal Division.*

August 14, 1909.—The steamer *Glengarry*, of Montreal, 732 gross tons, while on her way down the Lachine canal, struck a pier and sank in 16 feet of water. She was afterwards raised, put in dock and thoroughly repaired. No casualties.

October 17, 1909.—Steamer *Maggie R. Mitchell*, of St. Catharines, 40 gross tons, while lying in the Soulanges canal, caught fire during the night, burned to the water's edge and sank. She was subsequently removed and the machinery taken out. No casualties.

*Quebec Division.*

June 11, 1909.—The steamer *Pierreville*, of Sorel, collided with the Norwegian steamer *Kronprinz*, and sank in 30 feet of water, becoming a total loss. No casualties.

June 17, 1909.—SS. *Campana*, of Quebec, 1,697 gross tons, while on a voyage from pictou to Montreal, ran ashore at St. Valier's reef, becoming a total loss. No lives lost.

July 24, 1909.—The steamer *Laprairie*, of Montreal, 600 gross tons, while lying at her wharf was totally destroyed by fire. Cause of fire unknown. No casualties.

August 27, 1909.—Steamer *Prescott*, of Montreal, 1,107 gross tons, was destroyed by fire in Montreal harbour and sank. The cause of the fire unknown. No lives lost.

*Nova Scotia Division.*

December 9, 1909.—The ferry steamer *Halifax*, 338 gross tons, took fire about 2 a.m. while lying at her dock, and was burned so badly as to be totally unfit for service. Cause of fire supposed to be incendiarism. No fatalities.

February 7, 1910.—SS. *Centreville*, of Digby, 60 gross tons, was wrecked on ledge west of Trout cove, Digby county, Nova Scotia, becoming a total loss. No lives lost.

*New Brunswick and Prince Edward Island Division.*

Casualty returns 'nil.'

*Manitoba and Northwest Provinces Division.*

October 13, 1909.—The tug *Jim Puller*, of Port Arthur, 53 gross tons, while on a trip from Sturgeon Bay to Port Arthur, caught fire in after cabin under the main deck. She was immediately headed for the shore and beached, becoming a total loss. Cause of the fire is unknown.

December 9, 1909.—The dredge 'No. 8,' owned by the Great Lakes Dredging Company of Port Arthur, 515 gross tons, while being towed across Thunder bay to Port Arthur, and when out about one hour and a half, suddenly began to take in water



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and sank in a few minutes, having a crew of eleven men on board, five of whom succeeded in getting on board a scow that was lashed alongside the dredge. The remaining six went down with her and were drowned. Four weeks previous to the accident the dredge had been on the dry dock, and was then caulked and presumably had been put in seaworthy condition.

*British Columbia and Yukon Division.*

April 21, 1909.—SS. *Amur*, on a voyage to Naas river, stranded on a shoal at Metlakatla harbour, floated off at half flood, returned to Victoria, and had three plates renewed and frames repaired.

April 22, 1909.—SS. *Ramona*, plying on Fraser river, while returning to New Westminster, when near Wharton's Landing ran on a snag, striking her amidships on port side. She eventually sank, becoming a total loss.

April 29, 1909.—SS. *Princess May*, while on a voyage to Skagway the crank pin bolts of starboard engine broke, thereby breaking cylinder cover, bending connecting rod and piston rod, the foot of the connecting rod going through the side of condenser. She returned to Victoria with port engine for repairs. Again on October 22, when going into Prince Rupert she struck a submerged object, carrying away all the starboard propeller blades; the shock cracked the starboard main stop valve; returned to Victoria with one engine and repaired. On December 8, on a voyage from Skagway to Victoria, during a blinding snowstorm stranded on Vancouver island; remained there three hours, then proceeded to Victoria and was taken on dry dock. Damaged nine garboard plates, the fore part of keel plate, and fore foot of stem, which were repaired and the vessel again put in seaworthy condition.

May 27, 1909.—SS. *Coquitlam*, on a voyage from Vancouver to Portland canal, caught fire in paint locker, which gutted saloon and staterooms. Five men were badly burnt in the effort to subdue the flames, three of whom afterwards died.

September 9, 1909.—SS. *Stetson* when on a voyage to Ladysmith stranded on Burial island. She was floated off by Salvage Company. Damage to keel and stern post, with boiler and engines shifted; was placed on marine railway and efficiently repaired.

November 17, 1909.—SS. *Strathcona* on a trip from Chilliwack to New Westminster ran on a snag in Fraser river, opposite Page's Landing, ripping the bottom planking, and eventually sank. Though efforts were made to raise her, she became a total wreck.

I am, sir, your obedient servant,

E. ADAMS,  
*Chairman Board of Steamboat Inspection.*



## APPENDIX No. 11.

## METEOROLOGICAL SERVICE.

METEOROLOGICAL OFFICE, April 31, 1910.

The Deputy Minister of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the thirty-ninth annual report of the Meteorological service, this report being for the fiscal year ended March 31, 1910, with Appendices A and B, reports of St. John and Quebec observatories.

Owing to the large influx into Canada of people from European countries and the United States, the demand for information regarding the climate of the districts in which they desire to settle has increased to enormous proportions, and for this information we are much indebted to the voluntary observers, some of whom most patriotically, without any remuneration, have been forwarding reports to the central office for twenty years or more. The demand also for meteorological data for use in the settlement of legal disputes regarding damage by weather is continually increasing, and for this data we are also largely dependent upon the voluntary observer. The number of these observers is now considerably over 200, most of whom reported during the year.

Other observers are paid according to the importance of the station from a meteorological point of view, and the total number of voluntary and paid stations from which reports are received is 454. The number of persons in receipt of pay during the year was 248, of which 24 are on the permanent staff of the central office; 9 were employed temporarily for various periods at the same office, and 7 are retained permanently at the chief stations, where they devote their whole time to this service. At other stations only a portion of the observer's time is given up to the meteorological work. With very few exceptions, the work undertaken by the various observers has been most carefully performed, showing an interest in their work quite out of proportion to the remuneration allowed them.

## CENTRAL OFFICE.

After over a year spent in most cramped temporary quarters with the mechanical department, portions of the library and records detached, and nearly half a mile distant, all were once more brought together early in September, when the new meteorological building was completed. The consensus of opinion is that this building is, architecturally, one of the best in Toronto, and much praise is given to the architect, also to the agent of the Department of Public Works who had charge of its construction. The spacious offices and halls, allowing many improvements, are much appreciated by the staff, and undoubtedly will tend to even greater interest in the work of the service.

A fairly comprehensive report of the system of weather forecasts and storm warnings in connection with the meteorological service was given in last year's report, and the description therein will apply equally well to the past year, during which there has been no break in the work of the service. An important extension of the boundaries within which the forecasts and storm warnings are disseminated has, however, been made by the inclusion of Newfoundland, which colony has since February received



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meteorological bulletins quite similar to those received in the Canadian provinces. For the purposes of forecasting, Newfoundland is not quite as well situated geographically as are the maritime provinces, inasmuch as a certain percentage of high and low areas approach the island from the territory between Labrador and Hudson bay, while others move northward from the Atlantic, and it is only from barometric changes occurring at Bermuda and Sable island that their approach may be suspected. The Newfoundland Government has, however, established valuable stations at Point au Basques in the extreme west, and at Burin in the south, both of which forward bi-daily reports to Toronto. Other stations in the north are desirable, and it is hoped that a station will shortly be placed near the mouth of Hamilton inlet, to give indication of barometric changes occurring on the Labrador coast.

The barometric stations which were established in the summer of 1908 in the valley of the Mackenzie river are furnishing most valuable observations of atmospheric pressure in the far north, and while as yet the data available is insufficient to allow of definite conclusions as to the cause of the formations of anti-cyclones in high latitudes, it is obvious that important progress has been made towards filling the gap in a region hitherto void of anything beyond scattered and occasional reports.

It is doubtful whether there is any other region of the globe where the distribution of atmospheric pressure has so pronounced an effect on weather conditions as in southern Alberta, and this because a barometric gradient for northerly winds in winter means the transference of air from continental high latitudes across this country, while a westerly gradient means the flow of mild ocean air still further raised in temperature by the Chinook effect.

The observatory on Sulphur mountain, within the boundary of this region, at an altitude of 7,484 feet, and which has now been in existence for ten years, begins to yield a harvest of facts concerning the movements of the upper strata of the atmosphere, which it is now evident will be of very great value in the study of the climate of our western plains. The marked contrast in the character of the vertical temperature gradient as indicated by observation at Sulphur mountain and Calgary in warm seasons and cold seasons is certainly interesting, and cannot fail to be of value in the solution of problems connected with the physics of the atmosphere.

A further extension of the work of the central office is now proposed, and with this end in view the services of a highly trained physicist have been obtained, and investigation of atmospheric currents will shortly be made by kite and sounding balloon, and observations of atmospheric electricity and conductivity and ionization will be carried on concurrently with the study of pressure changes.

## INSPECTION.

Many stations were inspected during the year; others again had to remain without the requisite inspection, notably the telegraph reporting stations in the Gulf of St. Lawrence, as well as Belle Isle and Sable island, also the northern interior stations in British Columbia. The director visited Quebec, Montreal, and certain other places from Winnipeg to Victoria.

The assistant director adjusted several of the wind-recording stations in the lake region, reopening Pelee island which had been closed, visited numerous stations in the eastern portion of the maritime provinces; was deputed in January to revisit Newfoundland to reorganize certain matters, chiefly the Burin station which had been for some time in abeyance owing to a change of observers; and shortly after his return from Newfoundland proceeded to Bermuda, as the station there had received no inspection for four years, and recently a change of observers had there occurred. Bermuda, a most useful station to our service, is doubly so since we have started the forecasts for Newfoundland. The true force of the wind as recorded on the islands



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is of the utmost importance to us, and the visit proved the record as then being taken to be practically valueless, the apparatus having been allowed to fall into great disrepair.

Mr. W. D. Allan inspected the telegraph reporting stations in the northern portions of Saskatchewan and Alberta; also stations in the Peace river district, the latter receiving the first inspection. Messrs. H. V. Payne and Frank O'Donnell inspected some few stations in the lake region as the necessity arose.

Between April 1, 1909, and March 31, 1910, 1,895 warnings were issued from Toronto to ports on the great lakes, Gulf of St. Lawrence and maritime provinces, and of these, 92 per cent were verified; 31 warnings to Pacific coast ports were issued from Victoria, and 77.4 per cent of these were verified.

Applications for the establishment of signal stations are being continually received, and during the past year the claims of some twenty ports were advanced and are now being investigated.

With the exception of two or three short periods when the movement of areas of high pressure were quite abnormal, the accuracy of the daily forecasts was fully maintained, and many applications for special predictions were received. These requests are for both long or short periods, and in the case of the Fruit Growers' Association, who have learned how damage by frost may be averted by special forecasts, have requested and will be supplied with forecasts for the Niagara district.

Special predictions are probably more frequent during the winter, when shippers of perishable goods by rail take advantage of mild periods for forwarding, and by the number received during the past year it is evident their usefulness is much appreciated.

During the period of navigation vessel masters are frequent applicants for special information regarding the winds which may be expected, and during the past year a very large number of these forecasts were issued.

The special warnings of snow and drift to the various railways, whereby they are enabled to place heavy freight trains into sidings, and keep their lines open for passenger trains, also place snow ploughs in readiness, were issued to all railways; and with a very few exceptions the predictions were verified.



NUMBER OF PREDICTIONS AND PERCENTAGE OF FULFILMENT IN EACH DISTRICT FOR THE YEAR ENDED MARCH 31, 1910.

Month.	ALBERTA.				SASKATCHEWAN.				MANTORA.				LAKE SUPERIOR.				GEORGIAN BAY.			
	Verified.				Verified.				Verified.				Verified.				Verified.			
	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.
1909.																				
April.....	81	54	16	11	77.7	59	17	6	82.3	87	68	13	6	85.6	103	77	19	7	84.0	119
May.....	82	64	13	5	86.0	59	18	8	81.7	86	62	16	8	86.4	103	81	16	6	86.4	123
June.....	78	68	8	2	92.3	73	4	1	96.1	81	65	6	7	87.6	115	98	8	9	88.7	119
July.....	82	69	18	1	88.6	69	18	1	88.6	89	63	21	5	82.6	112	79	21	12	79.9	128
August.....	78	63	11	4	87.8	58	15	5	84.0	81	63	16	2	87.6	112	85	18	9	83.9	126
September.....	78	65	10	3	89.7	68	8	8	292.3	83	70	12	1	91.6	116	85	25	6	84.0	127
October.....	87	57	17	13	75.3	66	12	10	81.8	90	76	9	5	89.4	115	92	18	5	87.8	124
November.....	82	60	15	7	82.3	68	11	4	88.5	86	69	13	4	87.8	120	86	26	8	82.5	127
December.....	83	70	5	8	87.3	68	10	5	87.9	85	72	10	3	90.6	118	81	30	7	81.3	130
1910.																				
January.....	83	63	15	5	84.9	64	13	3	88.1	81	68	9	4	89.5	101	85	11	5	89.6	113
February.....	74	62	8	4	89.2	64	11	1	91.4	76	64	7	5	88.8	86	66	14	6	84.9	99
March.....	82	70	6	6	89.0	74	7	3	92.2	79	66	10	3	89.8	98	69	19	10	80.1	118
Totals.....	976	765	142	69	85.6	790	144	46	87.9	1004	809	142	53	87.6	1299	984	225	90	81.4	1453



NUMBER OF PREDICTIONS AND PERCENTAGE OF FULFILMENT IN EACH DISTRICT, FOR THE YEAR ENDED MARCH 31, 1910.

Month.	LOWER LAKES.					OTTAWA VALLEY.					UPPER ST. LAWRENCE.					LOWER ST. LAWRENCE.					
	Verified.					Verified.					Verified.					Verified.					
	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	
1909.																					
April.	119	97	21	1	90.3	101	82	13	6	87.6	101	81	15	5	87.6	108	71	26	11	77.8	
May	123	107	14	2	92.7	102	85	16	1	91.2	102	87	14	1	92.2	96	75	21	0	29.1	
June	120	106	10	4	92.5	113	105	3	5	94.2	114	104	4	6	93.0	119	96	10	13	24.9	
July	128	101	24	3	88.3	122	97	20	5	87.7	122	101	18	3	90.1	115	83	28	4	24.4	
August	127	104	18	5	88.9	122	101	20	1	91.0	122	99	22	1	90.2	124	96	18	10	24.7	
September	128	99	26	3	87.5	108	88	16	4	88.9	103	83	16	4	88.3	120	82	30	8	20.8	
October	124	105	17	2	91.5	116	100	14	2	92.2	116	106	9	1	95.2	116	87	16	13	21.9	
November	127	96	22	9	84.2	119	87	22	10	82.3	117	88	22	7	84.6	119	84	27	8	21.9	
December	131	106	19	6	88.2	111	88	19	4	87.8	108	88	18	2	89.8	123	100	15	8	27.4	
1910.																					
January	115	95	12	8	87.8	105	83	13	9	85.2	104	87	9	8	88.0	106	83	18	5	26.8	
February	99	81	16	2	89.9	95	69	23	3	84.7	94	71	21	2	85.7	96	69	20	7	22.3	
March	116	96	16	6	88.1	107	83	22	2	87.8	107	87	18	2	89.7	114	88	20	6	25.9	
Totals	1,459	1,193	215	51	89.1	1,321	1,068	201	52	88.4	1,310	1,082	186	42	89.7	1,356	1,014	249	93	23.9	



NUMBER of predictions and percentage of fulfilment in each district for the year ended March 31, 1910.

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Month.	GULF.			MARITIME WEST.			MARITIME EAST.			TOTALS.										
	Verified.			Verified.			Verified.			Verified.										
	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.	Number of predictions.	Number fully.	Number partly.	Number not.	Percentage.					
1909.																				
April.	109	78	23	8	82.1	105	77	20	8	82.9	103	74	23	6	83.0	1,218	913	229	76	84.4
May	103	79	22	2	87.4	117	100	14	3	91.5	117	91	22	4	87.2	1,236	995	203	38	88.7
June	117	93	12	12	84.6	125	108	9	8	91.0	124	112	7	5	93.1	1,303	1,130	92	81	90.2
July	114	73	34	7	78.9	126	87	33	6	82.1	126	86	32	8	80.9	1,358	1,011	290	57	85.1
August	123	86	29	8	81.7	125	88	25	12	80.4	125	84	29	12	78.8	1,343	1,025	244	74	85.4
September	124	87	29	8	81.9	124	101	20	3	89.5	125	95	26	4	86.4	1,314	1,021	243	50	86.9
October	113	87	21	5	86.3	115	85	25	5	84.8	115	85	26	4	85.2	1,319	1,053	199	67	87.4
November	126	94	22	10	83.3	132	100	21	11	83.7	130	93	25	12	81.1	1,368	1,019	248	101	83.5
December	123	91	24	8	83.7	123	95	17	11	84.1	123	89	24	10	82.1	1,341	1,048	217	76	86.2
1910.																				
January.	107	85	17	5	87.4	121	95	21	5	87.2	121	90	25	6	84.7	1,237	980	182	75	86.6
February.	96	70	16	10	81.2	109	75	26	8	80.7	109	77	23	9	81.2	1,109	842	207	60	85.3
March.	117	94	18	5	88.0	126	90	30	6	83.3	127	90	28	9	81.9	1,277	997	213	67	86.4
Totals	1,372	1,017	267	88	84.0	1,448	1,101	261	86	85.0	1,445	1,066	290	89	83.8	15,423	12,034	2,567	822	86.3







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The Milne seismographs at Victoria, B.C., and Toronto, have been kept in successful operation throughout the year. 71 disturbances were recorded by the former instrument and 65 by the latter; the number of large disturbances being somewhat less than for several years past.

The Mexican disturbance of July 30 was the largest of the series, and vibrations on the Victoria seismographs exceeded the scale of the instrument, showing a tilt of over 15.2'', in striking contrast to the small movement recorded at Toronto. In the larger number of cases the other disturbances were indicated by a mere thickening of the line. On September 30, the Toronto seismograph was installed in the basement of the new meteorological office in what appears to be a most satisfactory position, as there is no indication of air tremors, which so frequently vitiate the records of the seismograph.

## TIME SERVICE.

The time service in connection with the meteorological service has been continued from the new building on Bloor street, and the time balls at Montreal, Quebec and Halifax have been dropped daily during the season of navigation, except on Sundays; a time gun has been fired at Vancouver, and the firm alarm bells struck at 11.55 a.m. standard time 75th meridian, at Toronto. The mean time clock and chronometers at the magnetical observatory at Agincourt have been regulated by weekly time signals from the clock room in Toronto by means of an automatic electric device attached to the Toronto mean time clock. This clock is regulated to give the true standard time, by a system of small weights which are applied to the pendulum of the clock after daily comparisons with the sidereal clock. This ensures the giving of the correct time usually within the limits of a second. As a further check upon the time, the excellent mean time clock in the observatory of the University has been connected by wire with the clock room and is rated at each observation.

During the year ending March 31, 1910, 91 observations for time were made with the transit instrument; of these, 89 were sets of stars taken in the meridian and two solar observations as a check during long intervals of cloudy nights. The transit instrument in its new position has performed exceedingly well and the rate of the sidereal clock has remained very steady; in fact much more so than in its position in the old observatory; this is owing in part to the more uniform temperature of the new clock room as compared with the great range which obtained in the old observatory building.

Considerable time has been consumed in adapting the interior of the dome to the requirements of the 6-inch equatorial telescope. This instrument has, during the winter, been entirely overhauled, thoroughly cleaned, painted and relacquered and mounted upon its pedestal. The final adjustments are about to be made so that work with it will be presently commenced. During the fall the difference in level between the old and new observatories has been ascertained by means of reciprocal levelling with the dumpy level. A bench mark was established on the stone foundation of the new physic building of the University. This mark is 105 feet above the mean level of the bay, and the difference in level between it and the upper surface of the stone door sill of the new clock room is +26.6 feet, thus making the top of the door sill 131.6 feet above the mean level of the bay.

During the year a number of sidereal and mean time watches belonging to surveyors have been rated and regulated; also several aneroid barometers adjusted.

The time exchanges with Quebec, Montreal and St. John, N.B., have been continued, with results shown by the following table.



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The following table shows the difference between the times at Quebec, Montreal and St. John, at the various time exchanges, compared with that at Toronto.

The sign + indicates that Toronto is slow of the other observatories.

Year.	Quebec.	Montreal.	St. John.
1909.	Seconds.	Seconds.	Seconds.
April 2.....	+1·38	.....	+1·84
" 16.....	-0·49	-0·79	+0·63
May 7.....	+0·02	+0·97	+2·21
" 21.....	-1·25	+0·82	-0·10
June 4.....	+1·46	-0·37	.....
" 18.....	-0·70	+0·39	+1·64
July 2.....	-0·54	+0·38	+2·76
" 16.....	+0·21	+1·32	+0·29
August 13.....	0·21	-0·92	+0·08
" 27.....	-0·65	-0·07	-0·01
September 17.....	+3·34	+1·21	+0·57
October 8.....	-0·76	-0·03	-0·51
" 22.....	-2·22	-2·09	-0·11
November 19.....	+1·35	-1·26	+1·79
December 3.....	-1·56	+1·23	+1·31
" 27.....	-0·45	-0·08	-0·70
1910.			
January 7.....	-1·64	.....	.....
" 27.....	+4·49	+1·65	+1·45
February 18.....	+0·60	.....	+1·09
March 11.....	+1·29	+1·55	+1·58

All of which is respectfully submitted.

R. F. STUPART,  
*Director.*

APPENDIX A.

METEOROLOGICAL SERVICE, ST. JOHN OBSERVATORY,  
ST. JOHN, N.B., April, 1910.

R. F. STUPART, F.R.S.C.,  
Director, Meteorological Service,  
Toronto, Ont.

SIR,—I have the honour to present the annual report on the observatory at St. John for the fiscal year ending March 31, 1910.

*Meteorological Service.*—Meteorological observations, as particularized in my former reports, have been carried forward without interruption throughout the year. A small thermograph was added to the equipment. The various automatic and eye-reading instruments are in best possible condition.

Transportation companies, commercial houses and individuals are continuously making request for information from the office records to assist in adjustment of claims. The press also make free use of the office, and many items of interest to the general public are disseminated by this means.

*Weather Bulletin.*—The weather bulletin has been issued promptly every week day morning after receipt of the telegraphic message from the central office at Toronto. The forecasts, synopsis of prevailing conditions and data from selected stations give most satisfactory information, which is eagerly sought for and immensely valuable to mariners, shippers and many others interested in weather conditions.



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Copies of this bulletin are distributed through the mails, posted in public places, and published in full by one of our evening papers, the synopsis and forecasts only by the others.

Through the courtesy of the New Brunswick Telephone Company, the forecasts, received about 1 a.m., are at 6 o'clock each morning telephoned to all their offices in New Brunswick, and displayed on forms supplied to their various offices. This is a most valuable service done gratuitously by the telephone company, and is greatly appreciated by residents of the different localities.

As in the past, storm warning signal messages are telephoned to St. Martins and Point Lepreau, and signals displayed at these places.

Numerous daily requests made by telephone for information pertaining to the weather are answered at all times.

*Time Service.*—In April, 1909, the transit telescope was shipped to the makers, Messrs. Troughton & Simms, for some necessary repairs, and at the same time to be fitted with a transit micrometer. The instrument was not returned until the middle of August, when it was immediately remounted in its former position. The transit micrometer proved to be defective and was sent to the makers for alteration. It was returned early in November, but after trial was again found unsatisfactory, owing to imperfect mechanism. At the end of December it was again forwarded to the makers, and returned from them near the close of March. During the period the instrument was under repair an old and somewhat imperfect instrument was in use. Thus owing to the delays and unsatisfactory work of Messrs. Troughton & Simms our transit work for the entire year was done under difficulties, with many changes of method. Before sending the instrument to its makers they promised to complete the work in one month, but nearly one year elapsed before completion.

The time balls at St. John and Halifax have been dropped each week at 1 p.m., 60th meridian time. The electric clock at Halifax, which is daily synchronized from St. John, was moved to the new premises of the Western Union Telegraph Company last April. While removing and regulating clock the Halifax ball was dropped direct from St. John.

For the two minutes ending at 10 a.m., clock signals from this observatory are sent over Western Union wires throughout the maritime provinces. These automatic signals are transmitted direct from our standard mean time clock, are automatically repeated from the land lines to wireless at Camperdown N.S., and distributed to ships at sea within the zone of the Marconi station. Time has also for several years been transmitted through the telephone the beats of our clock relay being audible locally as well as in any part of the province through the long distance telephone system.

*Clocks.*—The standard sidereal clock by Riefler, run under constant pressure and temperature in the basement clock room, continues to give most excellent results. The Kullberg sidereal clock in clock room, the mean time transmitting clock and mean time master clocks in office are in good order.

There has been a considerable increase in the number of clocks on circuit in different parts of the city. These clocks are synchronized hourly by our master clock. The service is growing, and appears to give good satisfaction.

I have the honour to be, sir,

Your obedient servant,

D. L. HUTCHINSON,

*Director, St. John Observatory.*



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## APPENDIX B.

QUEBEC, April 9, 1910.

The Director, Meteorological Service,  
Toronto.

SIR,—I have the honour to transmit my annual report for the fiscal year ending March 31, 1910.

My duties as director of this observatory have remained the same and the usual observations were taken as heretofore.

The time ball which was dropped in a satisfactory manner during last season of navigation, is in good working order.

The correct time is given to the city as formerly by means of the noon gun on the Citadel, but seeing that the number of calls by telephone was constantly increasing, and that it was impossible to answer all of them, after inquiry I find that the gun is so placed that it cannot be heard in the city.

It is now fired across the river towards Lévis, and is surrounded by buildings.

I would therefore suggest that it should be removed to a better site, where it could be heard by the people of Quebec.

The whole respectfully submitted.

ARTHUR SMITH,  
*Director.*

## MAGNETIC OBSERVATORY.

The Deputy Minister of Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to submit the annual report of the Magnetic Observatory for the year ended March 31, 1910.

Mr. Menzies has continued as observer in charge of this observatory, and his zealous attention to duty, coupled with his unrivalled mechanical skill and a thorough knowledge of the theory of the instruments used, has resulted, as in years past, in an almost unbroken record of the magnetic changes. Weekly determination of the absolute values of declination, dip and bi-monthly determinations of the horizontal force, have been made throughout the year, and from these results the values of the photographic records obtained from the variometers have been computed. The photographic traces have as in the past been developed at the central office and then returned to Agincourt, where the ordinates of the curves have been measured at hourly intervals and at the occurrence of maximum and minimum; the results have been tabulated, and the daily and hourly means computed.

During the month of October, Mr. Menzies took simultaneous observations of declination, inclination and horizontal force with an officer of the Dominion Astronomical Observatory, and with Mr. W. E. Jackson on his return from the Arctic region, in order to determine instrumental differences. During November, observations were taken with two officers of the Department of the Interior in order to determine the constants of dip circle No. 77.

The Surveyor General having inaugurated the taking of compass determinations of declination by certain surveyors, it became necessary to establish the index corrections of these instruments, and in accordance with his instructions sixty-two instruments have been sent at various times to this observatory by surveyors engaged in the work. The index correction to these instruments have been established by comparison with our Standard declinometer, two sets of observations being taken for each instrument by Mr. Menzies. Duplicates of these observations have been sent to the officer of the Topographical Branch who has charge of this work, together with such comments as were deemed necessary. It is very obvious that the observatory holds an important



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place as a base station for the science of terrestrial magnetism in Canada, and also as a centre at which the standard instruments of other countries may be compared with those of the Dominion. Within the past year, determination of the magnetic values have here been made with the instruments loaned by the Carnegie Institution for scientific research for use on the D.G.S. *Arctic* during the year 1908-9, thus affording a very satisfactory comparison between the instruments used in Canada and those used in the United States.

During the year the magnetic declination has increased by  $4'.2$ ; from  $5^{\circ}:58'.2$  to  $6^{\circ}:2'.6$ . The horizontal component has diminished slightly, and the mean inclination of the needle has changed from  $74^{\circ}:37'.4$  to  $74^{\circ}:38'.6$ . A number of important magnetic disturbances have been recorded, the most important one occurring on September 25 coincidently with strong earth currents, which seriously affected the working of ocean cables and telegraphs. The most recent disturbance occurred on March 27, when the declination magnetic ranged through an arc of  $2^{\circ}:12'$ .

When away on the D.G.S. *Arctic*, Mr. Jackson obtained the magnetic values at the following points: Winter harbour, Melville island, Beechy point, Dealy island, Cape Bounty, Bridport inlet, Griffith's point, Point Gillman, Byam Martin island, Point Hotspur, Bathurst island, Browne island, Barrow strait, River Clyde, Baffin Land, Blacklead island, Cumberland gulf, Port Burwell and Ashe inlet, Hudson's straits. These determinations will be a valuable contribution to the science of terrestrial magnetism.

Respectfully submitted,

R. F. STUPART,  
*Director.*



APPENDIX No. 12.

RADIOTELEGRAPHIC SERVICE.

OTTAWA, May 16, 1910.

G. J. DESBARATS, Esq.,  
Deputy Minister, Marine and Fisheries Department.

SIR,—The following 29 radiotelegraphic stations are now in operation in the public service of Canada:—

Land stations owned and operated by the Department of Marine and Fisheries:—

Victoria, B.C., Vancouver island...	range 200 miles.
Pt. Grey, B.C., Vancouver, B.C....	" 100 "
Cape Lazo, B.C., Gulf of Georgia...	" 100 "
Pachena, B.C., Pacific ocean...	" 300 "
Estevan, B.C., Pacific ocean...	" 150 "
Triangle Island, B.C., Pacific ocean...	" 350 "
Ikeda Head, Q.C.I., Hecate strait...	" 250 "
Prince Rupert, B.C....	" 250 "

The above west coast stations handled business as follows during the past year:—

Number of messages sent...	8,689
Number of messages received...	9,780

Total... 18,469 messages, 265,414 words.

The cost of maintenance of the above stations for year ending March 31, 1910, was \$12,320.82.

Land stations owned by the Department of Marine and Fisheries and operated by the Marconi Wireless Telegraph Company of Canada under contract with the department:—

Father Point, P.Q., River St. Lawrence...	range 250 miles.
Clark's City, P.Q., River St. Lawrence...	" 250 "
Fame Point, P.Q., Gulf of St. Lawrence...	" 250 "
Heath Pt., Anticosti, Gulf of St. Lawrence...	" 250 "
Harrington, P.Q., Gulf of St. Lawrence...	" 150 "
Pt. Rich, N'f'ld., Gulf of St. Lawrence...	" 250 "
Pt. Amour, N'f'ld., Belle Isle straits...	" 150 "
Belle Isle, N'f'ld., Belle Isle straits...	" 250 "
Cape Ray, N'f'ld., Cabot straits...	" 350 "
Cape Race, N'f'ld., Atlantic ocean...	" 400 "
Cape Bear, P.E.I., Northumberland straits...	" 150 "
Cape Sable, N.S., Atlantic ocean...	" 250 "
Partridge Island, N.B., St. John, N.B....	" 250 "

The above east coast stations handled business as follows during the past year:—

Number of messages sent and received...	50,157
Number of words...	784,015

The total cost of maintenance of the above stations for the past year was \$47,533.70.



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Land stations owned by the Marconi Wireless Telegraph Company of Canada, and operated by them under contract with the Department of Marine and Fisheries:—

North Sydney, N.S., Cabot strait.. . . .	range 100 miles.
Pictou, N.S., Northumberland strait.. . . .	" 100 "

The above stations handled business as follows during the past year:—

Number of messages sent and received.. . . .	579
Number of words.. . . .	7,199

The total cost of maintenance of the above stations for the past year was \$3,500.

Land stations owned by the Department of Public Works, and operated by the Marconi Wireless Telegraph Company under contract:—

Quebec, P.Q., River St. Lawrence.. . . .	range 100 miles.
Grosse Isle, P.Q., River St. Lawrence.. . . .	" 100 "

Land stations owned and operated by the Marconi Wireless Telegraph Company:—

Montreal, P.Q., River St. Lawrence.. . . .	range 200 miles.
Three Rivers, P.Q., River St. Lawrence.. . . .	" 150 "
Camperdown, N.S., Halifax, N.S.. . . .	" 250 "
Sable Island N.S., Atlantic ocean.. . . .	" 300 "

Sable Island and Camperdown stations handled business as follows during the past year:—

Number of messages sent and received.. . . .	14,872
Number of words.. . . .	165,156

The following Canadian Government steamers are equipped with wireless apparatus, and are operated by the Department of Marine and Fisheries:—

C.G.S. <i>Quadra</i> .. . . .	range 100 miles.
C.G.S. <i>Minto</i> .. . . .	" 150 "
C.G.S. <i>Stanley</i> .. . . .	" 150 "
C.G.S. <i>Lady Laurier</i> .. . . .	" 150 "
C.G.S. <i>Aberdeen</i> .. . . .	" 100 "
C.G.S. <i>Druid</i> .. . . .	" 100 "
C.G.S. <i>Earl Grey</i> .. . . .	" 200 "
C.G.S. <i>Montcalm</i> .. . . .	" 150 "
C.G.S. <i>Canada</i> .. . . .	" 100 "

## CONSTRUCTION WORK.

*Victoria, B.C.*—A new operating house was erected at Victoria station, and a 2 K.W. plant of the latest type installed. The engine and old apparatus were removed from the dwelling house.

The cost of the above work was \$4,243.93.

*Pachena, B.C.*—The operating house was altered to take a new 2 K.W. plant, and a complete 2 K.W. plant was installed.

The cost of the above work was \$3,774.25.

*Triangle Island, B.C.*—A complete new station was erected on Triangle Island, consisting of one dwelling house and outbuildings; one 198-foot housing mast; one operating house, and one complete 6 H.P. 2 K.W. plant.

The total cost of the work was \$9,892.62.

*Ikeda Head, Q.C.I.*—A complete new station was erected at Ikeda Head, Q.C.I., B.C., consisting of: one 228-foot housing mast; one dwelling house and outbuildings; one operating house; one complete 6 H.P. 2 K.W. plant; two miles of trail and telephone line into Ikeda bay.

The total cost of the work was \$12,205.70.



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*Prince Rupert, B.C.*—A complete new station was erected at Prince Rupert, B.C., consisting of: one dwelling house and outbuildings; one operating house; two 199-foot housing masts; one complete 6 H.P. 2 K.W. plant; 500 feet tramway (20-lb. rail); one gasoline hoist house; one storehouse at foot of hill.

The total cost of work to date was \$14,107.40.

*Point Grey, B.C.*—One concrete water tank was installed at a cost of \$221.78.

*Estevan, B.C.*—A concrete foundation was installed at Estevan for engine and machines; also a concrete water tank.

The cost of the work was \$90.14.

*Whittle Rocks, Harrington, Belle Isle.*—The 2 K.W. station at Whittle Rocks was dismantled, and the mast and buildings transferred to Harrington, P.Q.

*Harrington, P.Q.*—The building and mast dismantled at Whittle Rocks were re-erected at Harrington, and the small plant from Belle Isle was installed.

*Belle Isle, Newfoundland.*—The 140-foot mast was taken down and replaced by a standard 186-foot housing mast. The station building was enlarged to accommodate the 2 K.W. plant from Whittle Rocks, which was installed.

The total cost of the above changes was \$5,318.54.

A 24 hour per day service was given on the east coast stations, and a 16 hour per day service on the west coast stations.

The erection of the stations at Triangle Island, B.C., Ikeda Head, Q.C.I., and Prince Rupert, B.C., completed the chain along the British Columbia coast. Ships bound from Vancouver to Prince Rupert on the inside passage are now in communication practically all the voyage, whilst those on the outside are never out of range of one or another of the different stations.

The station at Ikeda Head has placed the Queen Charlotte islands in direct communication with the mainland.

All the stations are working excellently, and are giving a very satisfactory service.

I am, sir, your obedient servant,

C. P. EDWARDS,  
*Superintendent Dominion Government Wireless Stations.*



## APPENDIX No. 13.

## REPORT OF LIFE SAVING SERVICE OF CANADA.

To the Deputy Minister  
of Marine and Fisheries.

SIR.—I have the honour to submit herewith a report on the Life Saving Service of Canada for the year 1909-10, giving all alterations and improvements, the cost of maintaining each station, and the reports of inspections.

## REPORT OF LIFE-SAVING STATIONS.

*Alberton.*—A rocket apparatus has been placed, and house built for the same. The brigade, consisting of the coxswain and crew of the lifeboat, were instructed in use of apparatus, &c., in December, 1909, by Commander H. Thompson, R.N. On September 19, the *Hazel Glen* grounded on the bar at Cascumpeque, and was salved by the lifeboat crew—compensation from owner of *Hazel Glen*.

*Brier Island (Westport).*—October, 1909.—The offer of Mr. Brown of a larger gasoline boat for the life saving service for an extra \$100 a year was accepted.

October 15.—The *Nettie H.* disabled in a gale, and towed in by lifeboat.

November 29.—During heavy gale rescued boats trawling.

January 25.—Towed schooner *Colgate* out of dangerous position into safety.

*Baker's Cove.*—Repairs to slip way carried out in July. No wrecks.

*Banfield Creek.*—A new motor lifeboat was built by the Electric Launch Company, Bayonne City, N.J., and arrived at station in February, 1910. The crew at this station also have charge of Pachena lifeboat, Lyle gun and rocket apparatus.

*Blanche.*—Assistance was rendered to the *Elizabeth Silsbee* in January, and on November 25 the lifeboat went out to assist a vessel in distress but she got off before the boat reached her.

*Canso.*—New boathouse completed June 30. October 31, the schooner *Blanche* went ashore at North entrance of harbour and was assisted off by lifeboat.

*Cape Tormentine.*—No casualties.

*Charlottetown.*—October 15.—Schooner was reported ashore at Governor's island. Lifeboat towed out by C.G.S. *Brant*, but no vessel could be seen.

*Clarke's Harbour.*—No wrecks or casualties.

*Clayoquet.*—No wrecks or casualties.

*Cobourg.*—September 4.—Rendered assistance to *Ontario No. 1*, which grounded in a dense fog.

*Collingwood.*—No wrecks or casualties.

*Consecon.*—No wrecks or casualties.

*Devil's Island.*—April 26.—Fishing schooner *Montana* went ashore in a gale, but got off again with the assistance of the lifeboat.

*Duncan's Cove.*—July 22.—A three-masted schooner went ashore on Sisters rock. The lifeboat promptly went to her assistance, and after a time she was got off.

*Goderich.*—November 11.—Schooner *Kolfage* struck North pier of Goderich harbour and was reported in a sinking condition. Lifeboat went to her assistance. Crew was paid one extra drill for this service.



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*Herring Cove.*—July 16.—The lifeboat went off to the assistance of the *Effie May*, ashore off Sandwich port; the coxswain finding her abandoned, took charge until arrival of owner. August 18—went out to assist steamer ashore, but she was towed off by two tugs.

*Kincardine.*—No wrecks or casualties.

*Long Point.*—In October it was directed to move this station from its old position to a spot about 1½ miles from the lighthouse on east end of point. The work was commenced, but bad weather setting in it had to be discontinued in December.

*Pachena Point.*—This station was established in December, the surf boat from Clo-oose being placed there, also the Lyle gun and rocket apparatus, and the whole worked in conjunction with the Banfield crew.

*Point Pelee.*—On October 12, the *George Stone* was wrecked on Grubb reef, but the lifeboat crew rendered no assistance. An inquiry was made, and the coxswain and crew dismissed, a temporary crew being enrolled for remainder of season, the boathouse being fitted up so that the crew could live there in bad weather.

*Picton.*—No wrecks or casualties.

*Port Hope.*—No wrecks or casualties.

*Port Mouton.*—No wrecks or casualties.

*Port Stanley.*—December 16.—The lifeboat went to assistance of *Astabula*, which went ashore at Port Burwell. Crew refused to leave vessel, and she was eventually got off. Compensation from the company.

*Richibucto.*—Boat was completed and crew engaged, June 30, 1909.

*Sable Island.*—Two new boats being considered for this station.

*Scattarie.*—No wrecks.

*Seal Cove, G.M.*—This having proved unsatisfactory, a new site was decided on at Outer Wood island, and the work of building boathouse, &c., started.

On October 26, the ss. *Hestia* was wrecked on Old Proprietor shoal; 34 lives were lost. Six men were saved by a sloop and schooner from Seal Cove, the crews of these boats being rewarded with \$10 to each coxswain and \$5 to each member of the crews.

*Seal Island.*—No wrecks.

*Seven Mile Creek.*—No wrecks.

*Souris.*—No wrecks.

*Southampton.*—No wrecks.

*St. Paul Island.*—October 26.—The *Canadienne*, with cargo of coal, wrecked at St. Paul. Crew of four taken off by lifeboat.

*Toronto.*—April 20.—Boathouse, boat and all equipment destroyed by fire. New boat received August 23. New house completed in December.

May 2.—Schooner *St. Louis* went ashore. Three men of the lifeboat crew launched the boat and landed the crew and captain's wife; for this service they received \$3 each.

*Tsusiatic.*—Patrol station; one man.

*Uclulet.*—No wrecks.

*Victoria Beach.*—A motor boat is being built for this place.

*Whitehead.*—Steamer *Cairn Crag* wrecked on July 27 at cove. The lifeboat put the agent on board, but no further assistance was required.

#### REPORT OF INSPECTION.

All the stations in the maritime provinces were inspected by Mr. S. C. Campbell during the year, and favourably reported on. Numerous suggestions were made by Mr. Campbell, which are under consideration. Complaints having been received about



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the life saving crew at Point Pelee, Lake Erie. Captain Robinson was sent to inspect station. He reported most unfavourably on coxswain and crew. On October 13 the *George Stone* was wrecked on Grubb reef, several lives being lost, and Commander Thompson was sent to make inquiries. On his report, the coxswain and crew were dismissed and a temporary crew enrolled. The general improvement of this station is under consideration for the coming season.

October 15.—Captain Robinson inspected the life saving station at Kincardine, and exercised the crew. His report on crew, boat, &c. was highly satisfactory.

In consequence of the wreck of the *Hestia* at Grand Manan. Commander Thompson and Mr. S. C. Campbell were sent down to look into the matter of the life saving station at Seal Cove, and after careful consideration, reported that the outer of Two Islands was the best place for a station. The building of a new station there has been considered, and will be completed before very long.

Commander Thompson was then sent to Prince Edward Island to instruct the lifeboat crew at Alberton in the use of the rocket apparatus, then to instruct the Priest Pond crew and crew of the Charlottetown lifeboat; after that to Halifax to instruct the crew of the *Canada*, and inspect life saving stations at Devil's Island, Duncan Cove and Herring Cove, and the following reports were received:—

*Alberton*.—December 7 and 8.—Thoroughly instructed crew in use of rocket apparatus, the men taking a very intelligent interest in it. Ended up with a highly satisfactory practice. Inspected station to Cascumpeque. Boathouse, boat and equipment in excellent order.

*Charlottetown*.—December 9 and 10.—Instructed No. 1 and three men of the Priest Pond Rocket Brigade, also Charlottetown lifeboat crew, in the use of the rocket apparatus, and finished with an excellent practice.

*Devil's Island*.—December 12.—Boat and all gear in good order.

*Duncan's Cove*.—December 12.—Everything in an extremely satisfactory state. Boat and gear in excellent working order, and the house very neat and well kept. Exercised the crew with the Lyle gun. Very good practice.

*Herring Cove*.—December 12.—Boat and gear in good condition. House clean and well looked after.

*C.G.S. 'Canada'*.—December 14, 15 and 16.—The crew of the *Canada* were given instructions in the rocket apparatus on the afternoon of the 15th. All necessary gear was placed in a surf boat and towed up the harbour and landed. The exercise was then carried out. The rocket fired over an old wreck about 300 yards off, and several men were landed in the breeches buoy, the whole exercise being done in very good time.

In conclusion, I wish to draw your attention to my report of March 2, 1909, and the suggestions contained therein. I am still of the opinion that on the great lakes and other places where the harbours are approached directly from the open, and no intricate navigation necessary, it would be better to present the place with a boat and boathouse and let the town itself do the rest. A more efficient crew would, I am sure, be the result. Now there is no one to be sure that they practise at all.

The following is a list of life saving stations, with amount expended on each for the year, for upkeep, payment of crews, alterations and improvements:—



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LIFE-SAVING Stations maintained

Number.	Stations.	Established.	Coxswain.	Crew.	Coxswain's salary. Per annum.	Pay of crew.
<i>New Brunswick—</i>						
1	Seal Cove.....	1898	T. Benson.....	7	\$ 75	\$2 per day and extra when saving life.
2	Richibucto.....	1907	Albert Long ...	7	75	" " ..
3	Point Escuminac....	1908	E. F. Fleiger...	7	75	" " ..
<i>Nova Scotia—</i>						
4	Bakers Cove.. . . .	1886	A. Cain.....	7	75	" " ..
5	Blanche.....	1889	W. A. B. Smith.	7	75	" " ..
6	Clarks Harbour . . . .	1900	T. N. Nickerson.	7	75	" " .
7	Causo.....	...	W. R. Matthews	7	75	" " ..
8	Devils Island.....	1885	B. H. Henneberry.	7	75	" " ..
9	Duncans Cove.....	1886	J. W. Holland..	7	75	" " ..
10	Herring Cove.....	1885	J. Gorman.....	7	75	" " ..
11	Pictou Island.....	1889	Alex. Currie....	7	75	" " ..
12	Port Mouton . . . . .	1889	Walter Cook....	7	75	" " ..
13	Scatarie . . . . .	1885	J. T. Martel....	7	75	" " ..
14	Seal Island.....	1880	Thos. Symonds..	7	250	\$100 per annum.....
15	St. Pauls Island....	1885	Supt. Humane Establishment.	3	...	\$300 each per annum.....
16	White Head . . . . .	1890	H. P. Munroe...	7	75	\$2 per drill and extra when saving life.
17	Sable Island . . . . .	1885	{ G. Soderberg.. { J. Ritcey.....	..... .....	250 } 250 }	Paid as island staff.....
<i>P. E. Island—</i>						
18	Priest Pond } .....	1909	J. B. Moore....	7	75 }	\$2 per drill and extra when saving life.
19	Charlottetown }	1907				
19	Souris.....	1907	N. McIntosh....	7	75	" " ..
20	Alberton.....	1907	John Champion.	7	75	" " ..
<i>British Columbia—</i>						
21	Pachena } .....	1909	W. H. Gillen...	.....	40 perm.	\$50 for engineer, \$45 for two men per month.
	Banfield }	1907			75 perm.	
22	Uclulet.....	1908	A. W. Lyche....	6	75 perm.	\$60 per month for men during season and \$100 per annum when boat is not in commission, Volunteers 50 cents per hour when required.
23	Tassiat . . . . .	1907	W. Kennedy....	1	60	Patrol.....
24	Clayoquot.....	1908	J. Chesterman...	7	75	\$60 per month when employed. Volunteers 50 cents per hour when required.
25	Seven Mile Creek.....	1909	R. E. Daykia...	1	60	.....
<i>Ontario—</i>						
<i>Great Lakes—</i>						
26	Cobourg.....	1882	D. Rooney.....	7	75	\$2 per drill and extra when saving life.
27	Collingwood.....	1885	G. F. Watts....	7	75	" " ..



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by the Dominion Government.

Description of Boat.	Cost.	Where Built.	Equipment.	Remarks.
	\$			
Beebe-McLellan surf-boat, self-bailing, 25 feet long.	250	Shelburne, N.-E	Full regulation..	Iron rails laid in 1901. New station being established.
Race point surf-boat, 24 feet-long..	225	" ..	" ..	
Beebe-McLellan self-bailing...	225	" ..	" ..	Boathouse to be built.
Dobbin's pattern self-righting, 25 feet long.	575	Dartmouth, N.S.	" ..	Iron rails laid in 1900.
Beebe-McLellan surf-boat, self-bailing, 25 feet-long.	250	" ..	" ..	New boat, 1901.
Beebe-McLellan self-bailing, 25 feet long, low ends.	250	" ..	" ..	Boathouse completed June 1909.
Dobbin's pattern, surf-boat, self-bailing, 25 feet long.	575	" ..	" ..	Lyle gun at this station.
Beebe-McLellan surf-boat, self-bailing, 25 feet long.	250	Shelburne, N.S.	" ..	Lyle gun at this station and new boat in 1903.
" " ..	250	" ..	" ..	
Dobbin's pattern, self-righting and bailing, 25 feet long.	575	Dartmouth, N.S.	" ..	
" " ..	575	" ..	" ..	
Beebe-McLellan surf-boat, self-bailing, 25 feet long.	250	Shelburne, N.S.	" ..	New boat in 1903.
Beebe-McLellan boat on east side.	240	" ..	" ..	"
Beebe-McLellan boat on west side.	240	Halifax, N.S....	" ..	
Beebe-McLellan self-bailing, 25 feet long, low ends.	250	Shelburne, N.S.	" ..	Lyle gun here since 1903.
Dobbin's pattern, surf-boat, self-bailing, 25 feet long.	575	Dartmouth, N.S.	" ..	
Two Dobbin's pattern, self-righting and bailing, and one Beebe-McLellan surf-bailing.	1,100	Halifax, N.S....	" ..	Lyle gun and rocket apparatus at this station. Coxswain under control of Supt. of Humane Establishment.
Beebe-McLellan self-bailing ....	225	Shelburne, N.S.	" ..	
" " ..	225	" ..	" ..	
" " ..	225	" ..	" ..	Rocket apparatus has been placed and house for the same.
Doherty's Improved Beebe-McLellan, 25 feet long.	575	Vancouver Shipyard Co., Vancouver, C.-B.	" ..	Placed at Pachena Bay.
Self-righting self-bailing power lifeboat, 36 feet long.	11,184 52	Bayonne City, U.S.A.	" ..	New motor boat and Lyle gun in combination with Pachena Bay.
Doherty's Improved Beebe-McLellan, 25 feet long.	575	Vancouver Shipyard Co.	" ..	
" " ..	575	" ..	" ..	
Dobbin's pattern, self-righting and bailing.	750	Goderich, Ont..	" ..	
Beebe-McLellan self-bailing, surf-boat.	375	Collingwood, O.	" ..	New boat in 1896.



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LIFE-SAVING Stations maintained

Number.	Stations.	Established.	Coxswain.	Crew.	Coxswain's salary. Per annum.	Pay of crew.
					\$	
28	Goderich.....	1886	D. MacKay.....	7	75	\$2 per drill and extra when saving life.
29	Kincardine.....	1903	Thos. McGaw...	7	75	" " ..
30	Long Point.....	1902	Geo. Wisner....	7	75	\$2 per drill and \$40 per month for three months.
31	Point Pelee.....	1900	L. Wilkinson....	7	75	\$2 per drill and extra when saving life.
32	Port Hope.....	1889	W. T. Clark. ..	7	75	" " ..
33	Port Stanley.....	1885	J. R. Moore... ..	7	75	" " ..
34	Toronto Island... ..	1883	Wm. Ward.....	7	75	" " ..
35	Consecon.....	1898	John O. McLean	7	75	" " ..
36	Southampton.....	1907	John A. Mac-Auley.	7	75	" " ..

NOTE—

There are several other places in Canada, not regularly organized, which receive support from the N.S., Cape Tormentine, N.B., and Wellington on Lake Ontario. There is also a life saving station at



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by the Dominion Government—*Concluded.*

Description of boat.	Cost.	Where built.	Equipment.	Remarks.
	\$			
Surf-boat. ....	330	Collingwood, O.	Full regulation..	New boat in 1892.
Beebe-McLellan self-bailing, surf-boat.	350	" ..	" ..	New boat in 1903.
Surf-boat.....	500	" ..	" ..	
" .....	330	" ..	" ..	A tramway has been constructed at this station.
Dobbin's pattern, self-righting and bailing.	620	Goderich, Ont..	" ..	
Beebe-McLellan surf-boat, self-bailing, 25 feet long.	350	Collingwood, O.	" ..	
Dobbin's pattern, self-righting and bailing.	600	Goderich, Ont..	" ..	Removed from Popular Point in 1900.
" .. ..	750	" ..	" ..	Removed from Wellington in 1893.
Beebe-McLellan surf-boat, self-bailing.	330	Collingwood, O.	" ..	

Dominion Government, where there is a life-saving service of more or less importance, such as Halifax, Victoria, B.C., maintained by the Victoria Life Saving Association.



STATEMENT of expenditures for the fiscal year, 1909-10.

Station.	Alterations, &c.	Amount.
		\$ cts.
New Brunswick—		
Seal Cove, (Grand Manan) .. . . .	A new station is being established on outer of Two or Little Wood island .. . . .	75 00
Richibucto. . . . .	New station built. . . . .	999 40
Escuminac. . . . .		127 58
Cape Tormentine. . . . .		27 06
Nova Scotia—		
Bakers Cove. . . . .		285 00
Blanche. . . . .		371 02
Canso. . . . .	New station built. . . . .	809 03
Clarkes Harbour. . . . .		344 72
Devils island. . . . .		293 00
Duncans Cove. . . . .		196 90
Herring Cove. . . . .		299 00
Pictou. . . . .		285 15
Port Mouton. . . . .		323 40
Scattarie. . . . .		327 00
Seal island. . . . .		883 19
Whitehead. . . . .		271 00
Yarmouth. . . . .		253 27
St. Paul island. . . . .		2 50
Prince Edward Island—		
Alberton. . . . .	Rocket apparatus established. . . . .	492 85
Cascumpeque. . . . .		220 50
Charlottetown. . . . .		303 15
Priest Pond. . . . .	Rocket apparatus established. . . . .	956 90
Souris. . . . .		293 22
British Columbia—		
Banfield creek. . . . .	New motor boat to replace one wrecked. . . . .	11,184 52
Clayoquet. . . . .		1,743 94
Pachena. . . . .	New station established. (In connection with Banfield). . . . .	
Seven Mile creek. . . . .		176 00
Tsusiatic. . . . .		120 00
Uchulet. . . . .		1,731 06
Ontario's Great Lakes—		
Cobourg. . . . .		292 50
Collingwood. . . . .		305 15
Consecon. . . . .		277 12
Goderich. . . . .		412 34
Kincardine. . . . .		298 44
Long Point. . . . .	Started to move station to a new location. . . . .	1,745 88
Point Pelee. . . . .	House altered to accommodate crew. . . . .	363 56
Port Hope. . . . .		269 00
Port Stanley. . . . .		291 50
Toronto island. . . . .	New boat and boathouse to replace those destroyed by fire. . . . .	2,875 00
Southampton. . . . .		323 75
Miscellaneous—		
General account. . . . .		2,729 42
West Coast Trail. . . . .		1,004 41
Cloose. . . . .		110 00
Port Rowan. . . . .		62 92
		34,756 35

C. E. KINGSMILL,  
Rear Admiral.



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## APPENDIX No. 14.

## MASTERS AND MATES.

GEORGE J. DESBARATS, Esq.,  
Deputy Minister of Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to place before you the annual report in connection with masters' and mates' examinations throughout Canada.

There are at present fifteen offices where examinations are held, as follows: Nelson, B.C., Captain Hallett; Victoria, B.C., Captain Gaudin; Vancouver, B.C., Captain Eddie; Yarmouth, N.S., Captain Murphy; Lunenburg, N.S., Captain Wolff; Halifax, N.S., Captain Lugar; North Sydney, N.S., Captain Sutherland; Charlottetown, P.E.I., Captain Cameron; Edmonton, Alta., Captain Grant; West Selkirk, Man., Captain Thordarsen; Toronto, Ont., Captain Moller; Collingwood, Ont., Captain Coles; Windsor, Ont., Captain McGregor; Montreal, Captain Riley, and Ottawa, Captain Demers. At Victoria, Vancouver, Yarmouth, Lunenburg, North Sydney, Charlottetown, Halifax and Ottawa, examinations are held for all grades of certificates, which comprise foreign-going examinations as well as examinations for local certificates. At Nelson, Edmonton, West Selkirk, Toronto, Collingwood, Windsor and Montreal, examinations for local certificates only are carried out.

It will be noted that 355 examinations were held for various certificates and 14 for sight-test only. For coasting and foreign-going certificates, a diminution is shown in the number of examinations. This is due to various causes, amongst which the amendment to the Shipping Act, allowing vessels of 150 tons on coasting voyages without certificated master and vessels of 400 tons without certificated mate, and also the fact that vessels built and owned in the maritime provinces, of four or five hundred tons burden, are now being registered in Barbados, whereby the obligation to comply with the Canada Shipping Act is eliminated.

The Board of Trade has notified the department that in 1914, on January 1, the standard of examinations for foreign-going will be higher, and have requested the department to conduct the examinations on similar lines to theirs; in consequence, a schedule is now being prepared to meet their views in this respect.

I have the honour to be, sir,  
Your obedient servant,

L. A. DEMERS,  
*Chief Examiner.*



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LIST of number of candidates that have been examined by each examiner, and also different grades, from April 1, 1909, to March 31, 1910.

Name of examiner.	Masters for sea-going ships.	Masters for inland and coasting.	Mate for inland and coasting.	Mate sea-going.	2nd Mate sea-going.	Total.
	No.	No.	No.	No.	No.	
Capt. Gaudin.....	1	14	12	.....	4	31
" Eddie .....	3	16	16	4	6	45
" Murphy .....	7	24	10	6	3	50
" Wolff.....	.....	.....	1	.....	.....	1
" Lugar .....	4	12	5	1	4	26
" Sutherland.....	.....	5	3	.....	.....	8
" Cameron.....	.....	7	1	.....	.....	8
" McGregor.. . . .	.....	15	22	.....	.....	37
" Coles.....	.....	20	12	.....	.....	32
" Thordarson .....	.....	4	3	.....	.....	7
" Grant.....	.....	1	.....	.....	.....	1
" Moller. . . . .	.....	23	15	.....	.....	38
" Hallett .....	.....	1	1	.....	.....	2
" Demers.. .....	1	27	7	1	.....	36
" Riley .....	.....	17	16	.....	.....	33
Total .....	16	186	124	12	17	355

Copies issued of lost certificates—	
Masters. ....	32
Mates.....	8
	40

LIST and number of candidates that have been examined for sight test, from April 1, 1909, to March 31, 1910:—

Name of Examiner.	No.
Capt. Sutherland.. . . .	5
Capt. Lugar.. . . .	6
Capt. Demers... . . . .	1
Capt. Moller.. . . .	2
Total.. . . .	14



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## APPENDIX No. 15.

## MARINE SCHOOLS.

GEORGE J. DESBARATS, Esq.,  
Deputy Minister of Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to submit the annual report of attendance at the Marine Schools established at the various ports of the Dominion under the supervision of the Marine and Fisheries Department.

There are now seven schools where lectures were delivered during the winter. The total attendance has been 2,676.

In connection with this educational branch of your department, I regret to have to state that it has been disappointing. I cannot say that the attendance has diminished since the establishment of those schools, but it has certainly not increased. The only school where the attendance is highly satisfactory is the one at Vancouver.

Lectures in the schools in the maritime provinces have not received the attention of the sea-faring population that they deserved, and this, to such an extent respecting the school at Lunenburg, that the lecturer resigned his position owing to the lack of encouragement that he was receiving at the hands of the population, which is composed almost entirely of sea-faring men.

The Toronto school was not opened this winter, as the lecturer at that place had to absent himself through illness. The lecturer at Midland has notified the department of his resignation as lecturer owing to the lack of attendance.

The programme of tuition given at those schools is similar to that which was given at their establishment, and comprises all subjects of elementary nature absolutely necessary to mates and masters of vessels, as well as to those who desire to enter the sea-faring career. Other subjects are introduced according to the class of students attending.

I am positive that the little encouragement received is not due to the lack of knowledge and capacity on the part of our lecturers, as every one of the officials who were chosen to fulfil that task is a capable man, thoroughly versed in marine subjects and a fluent speaker. Fluency of speech is a necessary adjunct in dealing with matters which are in themselves very dry subjects and can only interest those who have some inclination for the sea-faring career.

The attached statement will show the number of lectures given, the minimum, maximum, average and total attendance at each school.

I have the honour to be, sir,  
Your obedient servant,

L. A. DEMERS,  
*Superintendent of Marine Schools.*



ANNUAL REPORT OF DOMINION MARINE SCHOOLS, 1909-10.

Schools.	Lectures.	Minimum.	Maximum	Average.	Total attend- ance.
Victoria.....	32	14	25	19·56	626
Vancouver.. . . .	34	5	33	25	850
Yarmouth ....	32	4	15	10·53	337
Midland.....	32	3	15	10	340
North Sydney.....	32	3	9	5·05	179
Collingwood.....	17	4	13	9·58	163
Halifax ....	27	0	13	6·7	181
Total.....	206	33	123	85·79	2,676



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## APPENDIX No. 16.

## INVESTIGATIONS INTO WRECKS.

GEORGE J. DESBARATS, Esq.,  
Deputy Minister of Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to submit a list of the wrecks and casualties which occurred to Canadian and foreign vessels in the Canadian waters during 1909 till January, 1910, and upon which preliminary or formal investigations were held.

All cases of casualties which happened last year have been judged and decision rendered, with the exception of the ss. *Georgetown*, which is now before the court at Quebec.

Investigations have been conducted by myself for the districts of Quebec and Ontario, by Captain Lugar for the maritime provinces. Captain Coles, the examiner of masters and mates at Collingwood, conducted a couple of inquiries of preliminary nature.

Mr. T. G. Mitchell, Lloyd's surveyor, of Victoria, also held two preliminary inquiries on the British Columbia coast.

I have the honour to be, sir,  
Your obedient servant,

L. A. DEMERS,  
*Acting Wreck Commissioner.*



ANNUAL report of wrecks and casualties which were investigated in 1909.

Name of Ship.	Where registered.	Remarks on casualty.
Anticosti Lightship.		On Nov. 21, 1908, grounded on White island reef. A preliminary inquiry was held in 1908, and a formal investigation ensued held at Quebec, on Feb. 5, 1909, by Captain Demers, and the decision arrived at was that the navigation of lightship Anticosti was performed in a careless way. The Captain's certificate was suspended from Feb. 9 to May 9, 1909. The Chief Officer was also censured.
Athabasca	Montreal, Q.	On Oct. 14, grounded on Flower Pot island. Preliminary inquiry was held at Collingwood by Capt. Coles in Oct. and a formal investigation ensued held at Collingwood by Capt. Demers on Nov. 17. Decision arrived at was that the stranding was due to the captain's carelessness in navigating the vessel and his certificate was suspended from Nov. 17, 1909 to Aug. 17, 1910.
Ashtabula	United States register.	On Dec. 12, grounded at Port Burwell, Ont., on entering harbour. Preliminary inquiry held at Collingwood by Capt. Coles on Jan. 11, formal investigation not recommended.
Corinthian	Montreal, Q.	On April 30, grounded in Richelieu rapids. Preliminary inquiry was held in Montreal by Capt. L. A. Demers, May 17, a formal investigation was recommended but has not been held as yet.
Coquitlan	British Columbia... No. 100205.	On May 27, took fire on her way through the Gulf of Georgia. Preliminary inquiry held at Victoria, B.C., by Mr. T. G. Mitchell Lloyd's Surveyor, and the decision arrived at was, that nobody was to blame for the casualty; therefore, no formal investigation.
Campana	Quebec, Q.	On June 17, grounded at a place near or about Pointe St. Michel in River St. Lawrence. A formal investigation was held at Quebec by Capt. Demers on June 26, and the decision arrived at was that the captain of the ship rendered himself guilty of a culpable error of judgment in navigating the vessel, and his certificate was suspended from July 3 to April 3, 1910.
Cairnrag		On July 26, 1908, grounded on Snorting rocks, Dover island, Canso, N.S. A formal investigation was held in Halifax by Capt. W.R. Lugar on Aug. 2, 1909, and the decision arrived at, was that the captain of the ship has committed an error of judgment, but owing to his good character and length of service in one employ, his certificate was not dealt with.
Corinthian	Montreal, Q.	On Dec. 18, stranded near George's island, Halifax harbour. A preliminary inquiry was held at Halifax, on Dec. 23, by Capt. W.R. Lugar and a formal investigation ensued held at Halifax by same officer, Feb. 7, 1910, master and crew exonerated.
Dominion		On Nov. 17, grounded at Cap à la Roche. Preliminary inquiry was held in Montreal, Nov. 18, by Capt. Riley. Formal investigation not recommended.
Empress of Ireland		On Oct. 14, struck off Matane and upon reaching Rimouski was found leaking. A formal investigation was held at Quebec on Oct. 26, by Capt. Demers and the decision arrived at, was that the ship came in contact with the submerged hull of a derelict and no blame could be attached to any one for the casualty.
Glengarry	Kingston, Ont.	In Aug., sunk at the foot of Lachine canal, after doing some damages to the bridge. The captain and officers of the ship were exonerated from any blame for this casualty by the report of Surveyor. No other inquiry was held.
Glendall	Collingwood, Ont.	On Aug. 2, caused damages to pier at Port Colborne. A preliminary inquiry was held at Collingwood, in Sept. by Capt. Geo. C. Coles, and by the evidence adduced a formal investigation was not recommended.
Gcorgetown	Buffalo, U.S.A.	On Sept. 29, grounded on Hare island. Preliminary inquiry was held at Quebec, Oct. 15, by Capt. Demers and a formal investigation ensued on Oct. 11, held by the officer and the decision arrived at was that the pilot was solely responsible for the stranding. A rehearing of this case has been ordered, and this case is still pending.



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ANNUAL report of wrecks and casualties which were investigated in 1909—  
*Continued.*

Name of Ship.	Where registered.	Remarks on casualty.
<i>Hoyle Bank</i> .....		On Sept. 15, stranded near Sheet harbour, Halifax. Preliminary inquiry was held at Halifax on Oct. 13, by Capt. Lugar. Formal investigation could not be held owing to vessel's departure. This matter was subsequently referred to the Board of Trade.
<i>Hestia</i> .....		On Oct. 25, grounded at Grand Manan, 34 persons reported missing. Preliminary inquiry was held in Halifax and St. John by Capt. Lugar on Nov. 5. Formal investigation ensued, held by the same officer in Montreal, Nov. 12. The decision arrived at was that the wreck was due. 1. To error of compass due probably to Gaussins Error. 2. Neglect of soundings. 3. No sufficient allowance made for set of ebb-tide and strong wind. Error of judgment on the part of captain.
<i>Inishowen Head</i> .....	Belfast .....	On Oct. 1, 1908, grounded at Timony's cove some 5 miles above Quebec. A preliminary inquiry was held in Montreal on Oct. 12, 1908, by Capt. J. Riley and a formal investigation ensued and held in Montreal on Aug. 2, 1909, by Capt. L. A. Demers and decision arrived at, was that the pilot in charge has been guilty of a gross error in judgment and the grounding was caused by his fault. He was fined \$50.
<i>Jeanara</i> .....	Montreal, Q. ....	On Aug. 13, went ashore on Cranberry head, Sydney. Preliminary inquiry was held at Sydney, by Capt. Demers on Aug. 25, and by evidence adduced, formal investigation was not recommended.
<i>Margaret</i> .....		On Aug. 19, grounded on Thrum Cap Shoal, at the entrance to Halifax, N.S., preliminary inquiry was held at Halifax, by Capt. W. R. Lugar, Aug. 23. A formal investigation ensued, held at Halifax by the same officer Sept. 21, and the decision arrived at was that the captain was to blame for the grounding.
<i>Montezuma</i> .....		On Oct. 28, grounded at Cap-à-la-Roche. Formal investigation was held in Montreal on Nov. 2, by Capt. Demers and the decision arrived at was that the stranding was due to an error of judgment on the part of the pilot and also carelessness of captain. Both were reprimanded.
<i>Odlandr</i> .....	Norway .....	On May 31, grounded on the shoal, extending from Pte. à Pic on the north shore of the river St. Lawrence. A preliminary inquiry was held at Quebec by Capt. Demers in June, and on 5th of same month a formal investigation ensued held by the same officer and the decision arrived at was that the pilot in charge did not take necessary precautions to avoid this casualty; on the said pilot was inflicted a penalty of \$50.
<i>Otonabee &amp; Rainbow</i>	Birdsall, Ont. Peterborough, Ont.	On Aug. 31 collided at a point near Hales bridge, Otonabee River, Peterborough. A formal investigation was held at Peterborough by Capt. Demers on Sept. 25 and the decision arrived at was due to the overhanging foliage which partly intercepts the view at the bend of Otonabee River, below the bridge. The two captains were exonerated.
<i>Ocean</i> .....	Norway .....	On Sept. 28 grounded on Red island, River St. Lawrence. A preliminary inquiry was held at Halifax in Oct. by Capt. W. R. Lugar, and a formal investigation ensued, held at Montreal by Capt. Demers on Oct. 19. The decision arrived at was that the stranding was due to the carelessness of the captain in instructing his officers, and the 1st and 3rd officers for apparent negligence of the most elementary duties, and also to the carelessness of the pilot in charge. All these officers were severely reprimanded.
<i>Ottawa</i> .....		On Nov. 16 foundered on Lake Superior. Preliminary inquiry held by Capt. Coles, Collingwood, and result did not justify a formal investigation to be held.
<i>Pellatt and John Hanlan</i> .....		On June 30 collided at Toronto, Ont. Preliminary inquiry was held on July 17 by Capt. Demers in Toronto. The decision arrived at was that the collision was due to the fact that the engineer of the Pellatt rendered himself guilty of a culpable error of judgment and his certificate was suspended. The captain not blamable.



ANNUAL report of wrecks and casualties which were investigated in 1909—  
Concluded.

Names of ship.	Where registered.	Remarks on Casualty.
<i>Puritan</i> . . . . .		On June 19 grounded in Fraser river. Preliminary inquiry was held at Victoria, B.C., by Mr. J. G. Mitchell Lloyd's Surveyor, on July 16. Formal investigation was not recommended.
<i>Perry</i> . . . . .	Halifax, N.S. . . . .	On Dec. 29 stranded on Georges island. Preliminary inquiry was held in January 3 by Capt. W. R. Lugar and a formal investigation ensued held on February 14, 1910, at Halifax by the same officer. Decision arrived at was that the master is not to blame and is exonerated; but the mate is censured for neglect of duties and a fine of \$10 is imposed on him.
<i>Spheroid</i> .. . . .		On June 25 grounded at Cap-à-la-Roche. Preliminary inquiry was held at Quebec by Capt. Demers on June 28, and in face of evidence adduced, crew was at once exonerated. No formal investigation.
<i>Stigstad &amp; Syrene</i> ...	Norway. . . . . Canada . . . . .	On Sept. 11 collided in the St. Lawrence river, near St. Lawrence Pt. Formal investigation was begun at Montreal on Sept. 21 by Capt. Demers and resumed at Quebec on Oct. 4. The decision arrived at was that the collision was due to the pilot not exercising necessary and adequate precautions to avoid same, and that he acted contrary to arts. 20 and 28 of the rules of the road. The captain and second officer of the <i>Stigstad</i> were also held responsible for the collision and were censured.
<i>Scotia</i> .....		On Dec. 19, 1909, stranded near the Bay of Nicumteau, N.S. A preliminary inquiry was held at Nicumteau bay by Capt. W. R. Lugar. Formal investigation was not recommended.
<i>Torgorm and Pierre-ville</i> .....	Glasgow-Sorel. . . . .	On June 17, collided in the St. Lawrence, and the <i>Pierreville</i> sunk. A preliminary inquiry was held at Montreal by Capt. J. Riley on June 17. Formal investigation recommended, but has not been held as yet.
<i>Urania</i> .....	Norway.....	On Aug. 7, grounded on the reef extending from White island in the River St. Lawrence. A formal investigation held at Quebec by Capt. Demers on Sept. 8, brought out that the pilot in charge was not to be blamed for the grounding owing to the fact that the captain was primarily responsible for the stranding through his interference with the pilot. The captain was severely censured for interfering without cause.
<i>Wassaga and Tug J. Paul</i> . . . . .		On June 30, collided on Lake St. Louis near Chateauguay, one barge was totally destroyed, another sustaining certain damages. A formal investigation was held in Montreal by Capt. Demers on July 24, and the decision arrived at was that the collision was due to the careless navigation of ss. <i>Wassaga</i> , and the certificate of the captain was suspended and may be returned after one year, if satisfactory proof of reform is shown by the captain.
<i>Wacousta</i> . . . . .		On Sept. 28, grounded at Goose island. Preliminary inquiry was held at Quebec on or about Oct. 3 by Alfred Larochelle, and by evidence adduced formal investigation was not recommended.



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## APPENDIX No. 17.

## MONTREAL AND QUEBEC PILOTAGE.

GEORGE J. DESBARATS, Esq.,  
Deputy Minister of Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to submit to you my annual report respecting the Pilotage Corporations of Montreal and Quebec, which I have the honour to supervise. With reference to those two corporations, a detailed statement of their doings and earnings is herewith attached.

Last January, I personally presided over the examination of sight-test of each pilot of the two corporations, also of apprentice pilots. The examination was conducted by Holmgren's test, which is the method followed by the Board of Trade in England and all the British colonies. In this examination, I was assisted by the two doctors who were appointed a few years ago for the task. The tests were also witnessed by some of the directors of each corporation. I followed this method in order to show that the examination was performed in an impartial way. Last year, I understand that the examination in sight-test conducted by Dr. Duhamel in Montreal, was according to the German system, which differs materially from that adopted by the Board of Trade and incidentally by us. This year, my intention was to have the examination uniform for both corporations.

For the corporation of Montreal, one man has been excluded from the ranks, his sight having been found faulty. All the others have passed a satisfactory examination. In Quebec, one was excluded for deafness, another one owing to incipient paralysis, and a third one for deformity of the sight. There are two or three pilots who had been allowed formerly to be examined on the form-test with their glasses, which is contrary to the rules governing the system of examination. This matter is now before the department for decision as to whether these men should be allowed to practise as pilots.

In the examination of the apprentice-pilots, three were placed on the ranks, both in Montreal and Quebec, having passed a satisfactory examination both on sight-test and general education. Though it is not desirable that the number of pilots should be increased in either corporation, yet it is necessary that apprentice-pilots should be on hand, ready to fill any vacancy which may occur. This applies principally to the Quebec corporation, where a number of pilots will likely, within a few years, be taken from the ranks for various causes.

After making the acquaintance of each of the pilots, I can safely say that now, there is at the disposal of the shipping interests capable, competent and well-behaved men, and each of the pilots of either corporation will do honour to his calling.

I noticed a tendency on the part of every one to help the department in the carrying out of any regulations which it may deem proper to make in the future.

I have the honour to be, sir,

Your obedient servant,

L. A. DEMERS,  
*Chief Examiner.*



1 GEORGE V., A. 1911

REPORT, CORPORATION OF PILOTS FOR AND ABOVE THE HARBOUR OF QUEBEC.

Number of pilots.. . . . .	50	
	In	Out
Number of trips to Montreal.. . . . .	719	695
Number of trips to intermediate ports.. . . . .	42	54
Total earnings to Montreal.. . . . .	\$69,200	98
Total earnings to intermediate ports.. . . . .	2,946	15
Total... . . . .	\$72,147 13	
Total earnings of Tour-de-Rôle pilots.. . . . .	\$10,489 46	

Number of trips made by selected apprentice-pilots with branch pilots on ocean steamers, during the year.. . . .	546
Number of apprentice-pilots for and above the harbour of Quebec.. . . . .	24

Number of vessels reported in office, tonnage, crews, and number of passengers  
inward, 1909:—

Sea-going vessels.. . . . .	637
Lake steamers.. . . . .	270
Schooners.. . . . .	27
Barges, tugs and steam yachts.. . . . .	15
	949
The tonnage of those vessels... . . . .	2,190,756
Number of masters and crews.. . . . .	46,241
Number of passengers, inward.. . . . .	46,618

Pilotage.

Received by the Tour-de-Rôle pilots.. . . . .	\$2,000 00
Received from Richelieu and Ontario Navigation Co... . .	805 00
Received at the office of Montreal from various ship masters.. . . . .	1,260 00
Total amount.. . . . .	\$4,065 00

BRANCH PILOTS FOR AND BELOW THE HARBOUR OF QUEBEC, FOR 1910.

Number of pilots.. . . . .	92	
	In	Out
Pilotage effected.. . . . .	824	810
Pilots dead during the year.. . . . .	3	
Pension.. . . . .	1	
The actual number of pilots in service is.. . . . .	88	



APPENDIX No. 18.

MARINE HOSPITALS AND PORTS AT WHICH SICK SEAMEN WERE TREATED.

GEORGE J. DESBARATS, Esq.,  
Deputy Minister, Marine and Fisheries,  
Ottawa, Ont.

SIR,—I have the honour to submit the annual report of the transactions in the Marine hospital service for the fiscal year ended March 31, 1910.

I have the honour to be, sir,  
Your obedient servant,

C. H. GODIN, M.D.,  
*Medical Superintendent, Marine hospital service.*

MARINE HOSPITAL SERVICE—REPORT FOR THE YEAR 1909-10.

Amount of appropriation.. . . . .	\$70,000 00
Amount of expenditure.. . . . .	63,709 16
Balance.. . . . .	\$6,290 84

EXPENDITURE BY PROVINCES.

Province.	Number of Seamen.	Number of Days.	Total Expenditure.
			\$ cts.
Nova Scotia.....	1,682	14,880	28,763 48
New Brunswick.....	589	3,634	8,210 46
Prince Edward Island .....	230	1,026	2,874 33
Quebec .....	628	6,322	11,495 24
British Columbia.....	500	5,465	10,881 32
General Account.....			1,484 33
	3,629	31,327	63,709 16



TABLE showing the expenditure for each Port.  
*Nova Scotia.*

Port.	Number of Seamen.	Number of Days.	Total Expenditure.
			\$ cts.
Advocate Harbour. ....	5	7	85 40
Amherst. ....	6	150	203 25
Annapolis Royal. ....	9	75	175 65
Apple River. ....	1		10 00
Arichat. ....	18		250 00
Baddeck. ....	11		83 00
Barrington. ....	13	105	353 75
Barton. ....	8	301	471 53
Bear River. ....	2	30	162 84
Belliveau Cove. ....	1	60	21 43
Bridgewater. ....	45	72	267 05
Canning. ....	3		23 75
Canso. ....	98	170	522 21
Cheticamp. ....	24	62	419 90
Clarks Harbour. ....	40	367	751 62
Clementsport. ....	3	42	116 15
Digby. ....	40	100	491 31
Economy. ....	2		33 75
Freeport, Westport and Tiverton. ....	42	674	588 76
Glace Bay. ....	27	3	167 75
Guysboro. ....	2		5 25
Halifax General Hospital. ....	239	6,285	9,558 00
Halifax City Hospital. ....	1	22	112 21
Hantsport. ....	5	8	27 80
Ingram Port. ....	1		8 40
Isaacs Harbour. ....	3		47 50
Jeddore. ....	2		8 00
Jordans Bay. ....	1		5 00
Kentville. ....	1	70	55 00
Kingsport. ....	1		5 00
La Have. ....	4		495 75
Liscomb. ....	7		67 00
Liverpool. ....	6	505	389 84
Lockport. ....	8	100	134 68
Louisburg. ....	18	458	1,331 07
Lunenburg. ....	32	989	1,191 48
Mahone Bay. ....	32		158 85
Maitland. ....	1		1 00
Marble Mountain. ....	2		8 00
Margaree. ....	1		3 50
Margaretsville. ....	5	28	71 60
Meteghan. ....	4	42	199 63
North Sydney. ....	268	18	1,167 60
Northport. ....	9	10	34 10
North East Harbour. ....	1		5 00
Parrsboro. ....	65		302 45
Pictou. ....	104	153	911 86
Point Tupper & Hawkesbury. ....	19	37	300 14
Port Clyde. ....	1		13 00
Port Dufferin. ....	5		19 25
Port Greville. ....	15	49	135 00
Port Hastings. ....	5		30 00
Port Latour. ....	29	28	194 75
Port Morien. ....	15		125 00
Port Mulgrave. ....	3		9 50
Port Wade. ....	2	106	162 93
Pubnico. ....	11		226 00
Pugwash. ....	2		6 50
River Hebert. ....	7		34 50
Salmon River. ....	2	63	255 92
Sandy Cove. ....	21	56	317 50
Sydney. ....	74	1,459	2,148 13
Sheet Harbour. ....	4		15 25
Shelburne. ....	4	9	44 75
Springhill. ....	10	2-1	255 35
Spry Bay. ....	2		21 20



## SESSIONAL PAPER No. 21

TABLE showing Expenditure for each Port—*Continued.**Nova Scotia—Continued.*

Port.	Number of Seamen.	Number of Days.	Total Expenditure.
			\$ cts.
St. Peters, L'Ardoise and River Bourgeois.....	43	.....	194 00
Tidnish.....	1	59	201 14
Tusket Wedge.....	6	.....	22 80
Wallace.....	2	.....	9 75
Walton.....	3	23	84 05
Weymouth.....	21	127	249 87
Windsor.....	43	60	193 00
Yarmouth.....	101	1,617	1,989 53
Totals.....	1,682	14,880	\$28,763 48

*New Brunswick.*

Alma.....	1	.....	19 65
Beaver Harbour.....	3	.....	68 00
Bathurst.....	3	84	412 43
Buctouche.....	11	.....	17 25
Baie Verte and Cape Tormentine.....	25	.....	342 50
Campbellton.....	78	.....	403 25
Caraquet.....	11	.....	14 00
Chatham and Douglastown.....	41	388	992 95
Dalhousie.....	34	28	254 09
Dorchester.....	9	.....	41 45
Fredericton.....	5	10	44 55
Grand Harbour.....	2	28	52 50
Hillsboro and Hopewell Cape.....	47	48	222 02
Moncton.....	27	.....	200 00
North Head.....	5	.....	30 00
Port Elgin.....	1	.....	5 75
Richibucto.....	6	26	226 00
Riverside.....	4	.....	15 85
Shediac.....	16	.....	200 00
Shippagan.....	4	.....	9 50
St. Andrews.....	3	.....	33 75
St. John Public General Hospital.....	248	3,001	4,529 50
St. George.....	2	.....	20 95
St. Martins.....	2	.....	13 50
St. Stephens.....	1	21	41 02
Totals..	589	3,634	\$8,210 46

*Prince Edward Island.*

Alberton.....	8	.....	19 00
Crapaud.....	1	.....	65 50
Cardigan.....	3	.....	62 15
Charlottetown Hospital.....	18	431	666 50
Georgetown.....	5	.....	19 75
Montague.....	15	.....	30 85
Murray Harbour.....	40	15	401 35
New London.....	3	.....	45 20
Prince Edward Island Hospital.....	19	493	739 50
Rustico.....	2	.....	16 74
Souris.....	67	87	416 79
Summerside.....	36	.....	260 25
Tignish and Miminegash.....	11	.....	116 65
Vernon River.....	2	.....	14 10
	230	1,026	2,874 33



TABLE showing Expenditure for each Port—*Continued.*  
*Province of Quebec.*

Port.	Number of seamen.	Number of days.	Total expenditure.
			\$ cts.
Alexandra Hospital, Montreal.....	8	209	503 00
Batiscan.....	1	.....	10 00
Beauport.....	1	61	74 00
Chicoutimi.....	4	380	467 50
Fraserville and Rivière du Loup.....	2	7	15 25
Gaspé.....	34	7	204 00
Grande Rivière.....	6	.....	47 75
Matane.....	8	24	94 35
Montreal General Hospital.....	164	1,582	2,457 55
Notre Dame Hospital, Montreal.....	135	1,697	2,563 50
New Richmond.....	3	.....	44 50
Paspebiac and New Carlisle.....	35	49	185 49
Percé.....	5	.....	6 25
Port Daniel.....	3	.....	22 75
Jeffery Hale Hospital, Quebec.....	75	1,936	2,906 25
Hotel-Dieu, Quebec.....	15	207	310 50
Rimouski.....	3	.....	13 00
Sault au Mouton.....	7	.....	124 00
Seven Islands.....	4	.....	77 00
Sorel.....	4	.....	9 50
St. Johns.....	84	25	622 50
Three Rivers.....	27	138	736 70
	628	6,322	11,495 24

*British Columbia.*

Chemainus.....	6	100	521 44
Nanaimo.....	246	208	808 00
New Westminster.....	6	187	187 00
Prince Rupert.....	2	9	25 00
St. Joseph's Hospital.....	9	245	353 00
St. Paul's Hospital, Vancouver.....	142	3,035	4,552 50
Union Bay and Cumberland.....	19	206	879 25
Victoria.....	70	1,475	3,555 13
	500	5,465	10,881 32

*General Account.*

	\$ cts.
Travelling Expenses.....	436 13
Grants.....	600 00
Printing and stationery.....	446 85
Express.....	1 35
	1,484 33



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TABLE showing Expenditure for Treatment, Board Supplies, &c.

	Nova Scotia	New Brunswick.	Prince Edward Island.	Quebec.	British Columbia.	General Account.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Board in hospitals and private houses. ....	13,811 34	4,888 11	1,437 04	9,324 00	6,808 51	
Medical and surgical treatment .....	5,232 10	1,015 10	906 79	467 25	518 75	
Medical officers and keeper's salaries .....	6,610 87	2,076 21	512 50	1,546 24	2,250 00	
Fuel .....	787 85	52 10			312 40	
Drugs and instruments, &c .....	474 68	2 50			207 46	
Burials .....	60 00	26 00	10 00		34 75	
Telephone. ....	137 63	26 00			66 00	
Water. ....	117 00				35 80	
Transportation. ....	169 13	40 44	8 00	134 75	8 45	436 13
Repairs and maintenance. ....	948 13				558 65	
Special nursing.....	414 75	83 00		23 00		
Light .....					80 55	
Grants .....						600 00
Printing and stationery ..						446 85
Express charges.....						1 35
Total.....	28,763 48	8,210 46	2,874 33	11,495 24	10,881 32	1,484 33

TABLE showing amount of Salaries paid to Medical Officers and Keepers during 1909-10.

Nova Scotia.	\$ cts.	Nova Scotia—Continued.	\$ cts.
Annapolis Royal—		Parrsboro—	
Medical officer. ....	120 00	Medical officer.....	300 00
Arichat—		Pictou—	
Medical officer.....	250 00	Medical officer.....	400 00
Barrington—		Keeper .....	200 00
Medical officer.....	225 00	Point Tupper—	
Bear River—		Medical officer.....	100 00
Medical officer.....	150 00	Keeper .....	144 00
Canso—		Port Greville—	
Medical officer.....	375 00	Medical officer.....	75 00
Clarks Harbour—		Port La Tour—	
Medical officer.....	104 17	Medical officer.....	31 25
Digby—		Port Morien—	
Medical officer.....	250 00	Medical officer.....	125 00
Keeper .....	86 45	Sandy Cove—	
Freeport, Westport and Tiverton—		Medical officer.....	100 00
Medical officer.....	300 00	Sydney—	
Glace Bay—		Medical officer.....	500 00
Medical officer.....	150 00	Keeper ...	300 00
Liverpool—		St. Peters', L'Ardoise and River Bourgeois—	
Medical officer.....	100 00	Medical officer.....	187 50
Lóckport—		Weymouth—	
Medical officer.....	83 33	Medical officer.....	104 17
Louisburg—		Windsor—	
Medical officer.....	250 00	Medical officer.....	50 00
Keeper .....	300 00	Yarmouth—	
Lunenburg—		Medical officer.....	400 00
Medical officer.....	300 00		
Keeper .....	150 00		
North Sydney—			6,610 87
Medical officer.....	400 00		



TABLE showing amount of Salaries paid to Medical Officers and Keepers during 1909-10—Continued.

New Brunswick.	\$ cts.	Quebec.	\$ cts.
Bathurst—		Gaspé—	
Medical officer.....	140 00	Medical officer.....	200 00
Cape Tormentine and Baie Verte—		Paspebiac and New Carlisle—	
Medical officer.....	37 50	Medical officer.....	133 74
Campbellton—		St. John—	
Medical officer.....	350 00	Medical officer.....	600 00
Douglastown—		Three Rivers—	
Medical officer.....	450 00	Medical officer.....	612 50
Keeper.....	250 00		
Dalhousie—			1,546 24
Medical officer.....	72 69		
Hillsboro and Hopewell Cape—			
Medical officer.....	176 02		
Moncton—		British Columbia.	
Medical officer.....	200 00		
Richibucto—		Chemainus—	
Medical officer.....	200 00	Medical officer.....	450 00
Shediac—		Nanaimo—	
Medical officer.....	200 00	Medical officer..	600 00
	2,076 21	Victoria—	
Prince Edward Island.		Medical officer.....	600 00
		Keeper.....	600 00
Murray Harbour—			2,250 00
Medical officer.....	37 50		
Souris—		Total amount of salaries.....	12,995 82
Medical officer.....	225 00		
Summerside—			
Medical officer.....	250 00		
	512 50		

TABLE showing Expenditure for treatment, comprising Doctors' Services, Doctors' Travelling Expenses, Drugs and Board.

Nova Scotia.

Ports.	Doctors' Services.	Doctors' Travelling Expenses.	Drugs.	Board.	Total Expenses.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Advocate Harbour.....	13 00	42 00	7 75	3 50	66 25
Amherst.....	89 00	11 50	6 30	96 45	203 25
Annapolis Royal.....	18 00		5 50	32 15	55 65
Apple River.....	1 00	8 00	1 00		10 00
Baddeck.....	13 00	29 00	41 00		83 00
Barrington.....	34 00	41 00	5 75	48 00	128 75
Barton.....	124 00	99 00	56 45	128 53	407 98
Bear River.....				12 84	12 84
Belliveaus Cove.....				21 43	21 43
Bridgewater.....	135 50	12 00	66 85	51 45	265 80
Canning.....	6 00	13 00	4 75		23 75
Canso.....	25 00		122 21		147 21
Cheticamp.....	65 50	60 50	138 90	31 00	295 90
Clarks Harbour.....	254 00	179 00	101 05	113 40	647 45
Clementsport.....	20 00	73 00	5 15	18 00	116 15
Digby.....	28 00	84 00	42 86		154 86
Economy.....	5 00	28 00	0 75		33 75
Freeport, Westport and Tiverton.....				288 76	288 76
Glace Bay.....	12 00		3 50	2 25	17 75
Guysboro.....	3 00		2 25		5 25
Halifax Victoria General Hospital.....				9,427 50	9,427 50
Halifax City Hospital.....	23 00	46 00	27 50	15 71	112 21



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TABLE showing Expenditure for treatment, comprising Doctors' Services, Doctors' Travelling Expenses, Drugs and Board—*Continued.*

*Nova Scotia—Continued.*

Ports.	Doctors' Services.	Doctors' Travelling Expenses.	Drugs.	Board.	Total Expenditure.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Hantsport.....	16 00	.....	3 80	8 00	27 80
Ingram Dock.....	1 00	3 00	1 00	.....	5 00
Isaacs Harbour.....	11 00	21 00	15 50	.....	47 50
Jeddore .. .	2 00	5 00	1 00	.....	8 00
Jordans Bay.....	4 50	.....	0 50	.....	5 00
Kentville.....	.....	.....	.....	.....	55 00
Kingsport.....	2 00	.....	3 00	.....	5 00
La Have.....	134 00	257 50	71 25	.....	462 75
Liscomb.....	14 00	42 00	11 00	.....	67 00
Liverpool .. .	5 00	.....	.....	251 79	256 79
Lockport.....	6 00	.....	0 50	40 85	47 35
Louisburg.....	.....	.....	.....	222 38	222 38
Lunenburg.....	.....	.....	.....	515 00	515 00
Mahone Bay.....	112 00	.....	46 85	.....	158 85
Maitland.....	1 00	.....	.....	.....	1 00
Marble Mountain.....	5 00	2 00	1 00	.....	8 00
Margaree.....	1 00	.....	2 50	.....	3 50
Margaretsville.....	9 00	36 00	11 60	12 00	68 60
Meteghan .....	93 00	59 00	26 20	21 43	199 63
North Sydney .....	18 00	134 00	504 85	90 00	746 85
Northport.....	18 00	0 50	5 60	10 00	34 10
North East Harbour.....	1 00	.....	4 00	.....	5 00
Pictou .....	.....	.....	.....	69 85	69 85
Point Tupper.....	.....	.....	.....	17 14	17 14
Port Clyde .....	12 00	.....	1 00	.....	13 00
Port Dufferin.....	6 00	10 00	3 25	.....	19 25
Port Greville .....	26 00	1 00	8 50	24 50	60 00
Port Hastings .....	26 00	.....	4 00	.....	30 00
Port LaTour.....	90 00	59 50	2 00	12 00	163 50
Port Mulgrave.....	5 00	.....	4 50	.....	9 50
Port Wade .....	17 00	82 00	18 50	45 43	162 93
Pubnico.....	97 00	97 50	31 50	.....	226 00
Pugwash .....	4 00	.....	2 50	.....	6 50
River Hebert.....	11 00	13 00	10 50	.....	34 50
Salmon River .....	16 00	176 00	.....	22 50	214 50
Sandy Cove.....	101 00	60 00	22 50	34 00	217 50
Sydney .....	.....	.....	.....	670 28	670 28
Sheet Harbour .....	7 00	5 00	3 25	.....	15 25
Shelburne .....	15 00	9 50	2 50	4 50	31 50
Springhill .....	.....	.....	.....	252 90	252 90
Spry Bay.....	11 00	6 00	4 20	.....	21 20
St. Peter, L'Ardoise & River Bourgeois.....	3 00	.....	3 50	.....	6 50
Tidnish.....	10 00	36 00	63 00	52 14	161 14
Tusket Wedge .....	13 00	3 00	6 80	.....	22 80
Wallace .....	5 00	2 00	2 75	.....	9 75
Walton .....	42 00	.....	15 00	10 05	67 05
Weymouth .....	32 00	.....	7 75	92 00	131 75
Windsor.....	74 00	.....	33 00	36 00	193 00
Yarmouth.....	5 00	.....	.....	785 56	790 56
	1,950 50	1,846 50	1,435 10	13,811 34	19,043 44

*New Brunswick.*

Alma .....	2 00	16 00	1 65	.....	19 65
Beaver Harbour .. .	10 00	43 00	15 00	.....	68 00
Bathurst.....	119 50	.....	.....	65 13	184 63
Buctouche.....	11 00	.....	6 25	.....	17 25
Baie Verte and Cape Tormentine .. .	159 00	75 00	71 00	.....	305 00
Campbellton.....	45 00	.....	.....	.....	45 00
Caraquet.....	11 00	.....	3 00	.....	14 00
Chatham and Douglstown.....	.....	.....	.....	190 56	190 56



TABLE showing Expenditure for treatment, comprising Doctors' Services, Doctors' Travelling Expenses, Drugs and Board—*Continued.*  
*New Brunswick—Continued.*

Ports.	Doctors' Services.	Doctors' Travelling Expenses.	Drugs.	Board.	Total Expenditure.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Dalhousie.....	97 50	.....	52 90	21 00	171 40
Dorchester.....	26 50	4 50	10 45	.....	41 45
Fredericton.....	27 00	.....	6 15	11 40	44 15
Grand Harbour .....	8 00	30 00	3 00	11 50	52 50
Hillsboro and Hopewell Cape.....	.....	.....	.....	46 00	46 00
North Head.....	13 00	12 00	5 00	.....	30 00
Port Elgin.....	4 00	.....	1 75	.....	5 75
Richibucto .....	.....	.....	.....	26 00	26 00
Riverside and Harvey.....	6 00	2 00	7 85	.....	15 85
Shippigan .....	5 00	.....	4 50	.....	9 50
St. Andrews.....	8 00	21 00	2 15	.....	31 15
St. John .....	1 00	7 00	.....	4,501 50	4,509 50
St. George.....	12 00	.....	8 95	.....	20 95
St. Martins .....	11 00	.....	2 50	.....	13 50
St. Stephens.....	23 00	.....	3 00	15 02	41 02
	599 50	210 50	205 10	4,888 11	5,903 21

*Prince Edward Island.*

Alberton.....	12 00	.....	7 00	.....	19 00
Cardigan.....	33 00	.....	29 15	.....	62 15
Charlottetown Hospital.....	9 00	.....	3 00	646 50	658 50
Crapaud .....	33 00	16 50	16 00	.....	65 50
Georgetown .....	12 00	.....	7 75	.....	19 76
Montague .....	19 90	.....	11 85	.....	30 85
Murray Harbour.....	203 00	41 50	110 60	8 75	363 85
New London.....	9 00	25 00	11 20	.....	45 20
Prince Edward Island Hospital..	.....	.....	.....	739 50	739 50
Rustico.....	6 00	6 00	4 74	.....	16 74
Souris.....	90 50	.....	49 00	42 29	181 79
Summerside.....	6 00	.....	4 25	.....	10 25
Tignish and Miminegash.....	39 00	42 00	35 65	.....	116 65
Vernon River.....	10 00	.....	4 10	.....	14 10
	481 50	131 00	294 29	1,437 04	2,343 83

*Province of Quebec.*

Alexandra Hospital (Montreal).....	.....	.....	61 00	418 00	479 00
Batiscan.....	7 00	.....	3 00	.....	10 00
Beauport Asylum.....	.....	.....	.....	74 00	74 00
Chicoutimi .....	.....	.....	.....	456 00	456 00
Fraserville and River du Loup.....	5 00	1 00	2 25	7 00	15 25
Gaspé.....	.....	.....	.....	4 00	4 00
Grande Rivière .....	18 00	20 00	9 75	.....	47 75
Matane .....	26 00	5 00	15 25	48 00	94 25
Montreal General Hospital.....	.....	.....	.....	2,374 55	2,374 55
Montreal Notre-Dame Hospital.....	.....	.....	.....	2,545 50	2,545 50
New Richmond.....	15 00	12 00	17 50	.....	44 50
Paspebiac and New Carlisle ..	.....	.....	.....	36 75	36 75
Percé.....	5 00	.....	1 25	.....	6 25
Port Daniel .....	6 00	3 00	13 75	.....	22 75
Jeffery Hale.....	.....	.....	.....	2,903 00	2,903 00
Hotel-Dieu.....	.....	.....	.....	310 50	310 50
Rimouski.....	3 00	.....	7 00	.....	10 00



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TABLE showing Expenditure for treatment, comprising Doctors' Services, Doctors' Travelling Expenses, Drugs and Board—Continued.

Province of Quebec—Continued.

Ports.	Doctors' Services.	Doctors' Travelling Expenses.	Drugs.	Board.	Total Expendi- ture.
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Sault au Mouton.....	7 00	63 00	54 00	.....	124 00
Seven Islands.....	11 00	50 00	16 00	.....	77 00
Sorel.....	4 00	0 50	5 00	.....	9 50
St. Jean.....	.....	.....	.....	22 50	22 50
Trois Rivières.....	.....	.....	.....	124 20	124 20
	107 00	154 50	205 75	9,324 00	9,791 25

British Columbia.

Chemainus... ..	.....	.....	.....	71 44	71 44
Nanaimo.....	.....	.....	.....	208 00	208 00
New Westminster ..	.....	.....	.....	187 00	187 00
Prince Rupert.....	14 00	.....	.....	9 00	23 00
St. Joseph's Hospital, Victoria.....	.....	.....	.....	353 00	353 00
St. Paul's Hospital, Vancouver.....	.....	.....	.....	4,552 50	4,552 50
Union Bay and Cumberland.....	211 50	123 00	170 75	374 50	879 25
Victoria.....	.....	.....	.....	1,053 07	1,053 07
	225 00	123 00	170 75	6,808 51	7,327 26

DETAILED EXPENDITURE FOR FUEL.

Nova Scotia—

Louisburg Marine Hospital.. . . . .	\$166 50
Lunenburg Marine Hospital.. . . . .	173 00
Pictou Marine Hospital.. . . . .	135 15
Sydney Marine Hospital... . . . .	124 20
Yarmouth Marine Hospital.. . . . .	189 00
	<hr/> \$787 85

New Brunswick—

Douglastown Marine Hospital.. . . . .	52 10
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British Columbia—

Victoria Marine Hospital.. . . . .	312 40
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Total expenditure for fuel... . . . .	\$1,152 35
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DETAILED EXPENDITURE FOR WATER SUPPLY.

Nova Scotia—

Pictou Marine Hospital.. . . . .	\$100 00
Sydney Marine Hospital.. . . . .	17 00
	<hr/> \$117 00

British Columbia—

Victoria Marine Hospital.. . . . .	35 80
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Total expenditure for water.. . . . .	\$152 80
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DETAILED EXPENDITURE FOR TELEPHONE SERVICE.

<i>Nova Scotia—</i>	
Lunenburg Marine Hospital.. . . . .	\$27 00
Sydney Marine Hospital.. . . . .	75 63
Yarmouth Marine Hospital.. . . . .	35 00
	<hr/>
	\$137 63
<i>New Brunswick—</i>	
Douglastown Marine Hospital.. . . . .	26 00
<i>British Columbia—</i>	
Victoria Marine Hospital.. . . . .	66 00
	<hr/>
Total expenditure for telephone.. . . . .	\$229 63

DETAILED EXPENDITURE FOR REPAIRS AND MAINTENANCE.

<i>Nova Scotia—</i>	
Louisburg Marine Hospital.. . . . .	\$142 53
Lunenburg Marine Hospital.. . . . .	9 77
Pictou Marine Hospital.. . . . .	6 86
Sydney Marine Hospital.. . . . .	419 41
Yarmouth Marine Hospital.. . . . .	369 56
	<hr/>
	\$948 13
<i>British Columbia—</i>	
Victoria Marine Hospital.. . . . .	558 65
	<hr/>
Total expenditure.. . . . .	\$1,506 78

DETAILED EXPENDITURE FOR DRUGS, INSTRUMENTS AND OTHER SUPPLIES.

<i>Nova Scotia—</i>	
Louisburg Marine Hospital.. . . . .	\$249 66
Point Tupper Marine Hospital.. . . . .	39 00
Sydney Marine Hospital.. . . . .	41 61
Liverpool Marine Hospital.. . . . .	28 25
North Sydney Marine Hospital.. . . . .	20 75
Yarmouth Marine Hospital.. . . . .	95 41
	<hr/>
	\$474 68
<i>New Brunswick—</i>	
Douglastown Marine Hospital.. . . . .	2 50
<i>British Columbia—</i>	
Victoria Marine Hospital.. . . . .	207 46
	<hr/>
Total expenditure.. . . . .	\$684 64

GRANTS TO SEAMEN'S SOCIETIES.

Montreal Catholic Sailors' Club.. . . . .	\$200 00
Montreal Seamen's Institute.. . . . .	200 00
St. John, N.B., Seamen's Mission.. . . . .	200 00
	<hr/>
	\$600 00

DETAILED EXPENDITURE FOR LIGHT.

British Columbia, Victoria Marine Hospital... . . . .	\$80 55
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## DETAILED EXPENDITURE FOR TRANSPORTATION.

*Nova Scotia—*

Advocate Harbour.. . . .	\$ 19 15
Barton.. . . .	26 05
Bridgewater.. . . .	1 25
Halifax.. . . .	90 50
Ingram Port.. . . .	3 40
Liverpool.. . . .	4 80
Lunenburg.. . . .	2 71
Margaretsville.. . . .	3 00
Parrsboro.. . . .	2 45
Salmon River.. . . .	6 42
Springhill.. . . .	2 45
Walton.. . . .	3 00
Weymouth.. . . .	3 95
	<hr/>
	\$169 13

*New Brunswick—*

Bathurst.. . . .	4 80
Campbellton.. . . .	8 25
Chatham.. . . .	21 79
St. John.. . . .	2 60
St. Martin.. . . .	3 00
	<hr/>
	\$40 44

*Prince Edward Island—*

Charlottetown.. . . .	8 00
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*Province of Quebec—*

Alexandra Hospital, Montreal.. . . .	24 00
Fraserville.. . . .	3 50
Montreal General Hospital.. . . .	83 00
Montreal Notre Dame.. . . .	18 00
Jeffrey Hale Hospital, Quebec.. . . .	3 25
Rimouski.. . . .	3 00
	<hr/>
	\$134 75

*British Columbia—*

Prince Rupert.. . . .	\$2 00
Victoria.. . . .	6 45
	<hr/>
	\$8 45

Medical Superintendent's travelling expenses.. . . .	\$436 13
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Total expenditure for transportation.. . . .	\$796 90
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DETAILED EXPENDITURE FOR SPECIAL NURSING.

<i>Nova Scotia—</i>	
Barton.. . . .	\$ 37 50
Cheticamp.. . . .	124 00
La Have.. . . .	33 00
Lockport.. . . .	4 00
Louisburg.. . . .	14 00
Salmon River.. . . .	35 00
Shelburne.. . . .	13 25
Tidnish.. . . .	40 00
Walton.. . . .	14 00
Yarmouth.. . . .	100 00
	<hr/>
	\$414 75
<i>New Brunswick—</i>	
Bathurst.. . . .	83 00
<i>Province of Quebec.. . . .</i>	
	23 00
	<hr/>
Total expenditure for nursing.. . . .	\$512 75

DETAILED EXPENDITURE FOR BURIALS.

<i>Nova Scotia—</i>	
Halifax.. . . .	\$40 00
Weymouth.. . . .	10 00
Yarmouth.. . . .	10 00
	<hr/>
	\$60 00
<i>New Brunswick—</i>	
Dalhousie.. . . .	\$10 00
St. John.. . . .	17 00
	<hr/>
	27 00
<i>Prince Edward Island—</i>	
Souris.. . . .	10 00
<i>British Columbia—</i>	
Victoria.. . . .	34 75
	<hr/>
Total expenditure for burials.. . . .	\$131 75

MISCELLANEOUS.

Printing and stationery.. . . .	\$446 95
Express charges.. . . .	1 35
	<hr/>
	\$448 30

TOTAL NUMBER OF VOUCHERS FOR EACH PROVINCE.

General account.. . . .	23
Nova Scotia.. . . .	613
New Brunswick.. . . .	123
Prince Edward Island.. . . .	93
British Columbia.. . . .	122
Quebec.. . . .	119
	<hr/>
	1,093



## SESSIONAL PAPER No. 21

TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10.

## General diseases—851.

Smallpox.. . . . .	7
Measles.. . . . .	8
Scarlet Fever.. . . . .	3
Influenza.. . . . .	106
Mumps.. . . . .	4
Diphtheria.. . . . .	13
Cerebro Spinal Fever.. . . . .	2
Enteric Fever.. . . . .	86
Choleric Diarrhœa.. . . . .	14
Epidemic Diarrhœa.. . . . .	2
Dysentery.. . . . .	62
Beriberi.. . . . .	1
Malarial Fever.. . . . .	36
Erysipelas.. . . . .	29
Septicemia.. . . . .	36
Tubercle.. . . . .	32
Syphilis.. . . . .	84
Gonorrhœa.. . . . .	145

## Diseases dependent on animal parasites—

Scabies.. . . . .	8
Tenia.. . . . .	1
Scurvy.. . . . .	1
Alcoholism.. . . . .	3
Rheumatism.. . . . .	149
Gout.. . . . .	1
Osteoarthritis.. . . . .	3
New growth, non-malignant.. . . . .	4
New growth, malignant.. . . . .	1
Anemia.. . . . .	2
Diabetes Mellitus.. . . . .	2
Congenital malformations.. . . . .	1
Debility.. . . . .	2
Tetanus.. . . . .	3

## Local diseases—2,037.

## Diseases of the nervous system—104—

## 1. Of the nerves—

Neuritis.. . . . .	18
Multiple Neuritis.. . . . .	1

## 2. Of the spinal cords and membranes—

Inflammation.. . . . .	3
------------------------	---

## 3. Of brains and membranes—

Hemorrhage.. . . . .	2
Meningitis.. . . . .	1
Anemia.. . . . .	1



TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10—*Continued.*

Diseases of the nervous system—*Continued.*

4. Functional nervous diseases, with other diseases of undetermined  
nature—

Apoplexy.. . . .	1
Paralysis.. . . .	9
Spasm.. . . .	
Epilepsy.. . . .	3
Vertigo.. . . .	
Headache.. . . .	2
Neurasthenia.. . . .	12
Neuralgia.. . . .	47
Hysteria.. . . .	1

5. Mental diseases—

Insanity.. . . .	3
------------------	---

Diseases of the eye—116—

Conjunctivitis.. . . .	44
Keratitis.. . . .	5
Ulceration of cornea.. . . .	9
Iritis.. . . .	20
Optic Neuritis.. . . .	1
Abcess of lacrymal sac.. . . .	6
Blepharitis Marginalis.. . . .	12
Abcess of eyelid.. . . .	13
Ecchymosis of eyelid.. . . .	6

Diseases of the ear—65—

Inflammation of external meatus.. . . .	9
Accumulation of wax or epidermus.. . . .	3
Inflammation of middle ear.. . . .	51
Abcess axilla.. . . .	2

Diseases of the nose—9—

Inflammation of septum.. . . .	1
Necrosis of septum.. . . .	3
Inflammation of sinuses.. . . .	2
Inflammation of neso-pharynx.. . . .	3

Diseases of the circulatory system—39—

Pericarditis.. . . .	2
Endocarditis.. . . .	9
Valvular diseases.. . . .	27
Aneurism heart.. . . .	1

Inflammation muscular substance heart—55—

Angina Pectoria.. . . .	2
Arteritis.. . . .	6
Degeneration of arteries.. . . .	4
Phlebitis.. . . .	2
Varicose ulcer.. . . .	41



## SESSIONAL PAPER No. 21

TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10—*Continued.*

## Diseases of the respiratory system—368—

Inflammation of larynx.. . . .	18
Bronchitis.. . . .	182
Spasmodic Asthma.. . . .	24
Congestion of lungs.. . . .	2
Hemorrhage of lungs.. . . .	11
Pneumonia.. . . .	38
Broncho-Pneumonia.. . . .	11
Abcess of lungs.. . . .	1
Phtisis.. . . .	35
Pleurisy.. . . .	50
Empyema.. . . .	1
Injury to lungs.. . . .	2

## Diseases of the digestive system—416—

Inflammation of the mouth.. . . .	1
Ulceration of mouth.. . . .	1
Abcess of dental periosteum.. . . .	8
Toothache.. . . .	68
Necrosis Alveoli.. . . .	3
Sore throat.. . . .	7
Inflammation of tonsils.. . . .	58
Inflammation of the pharynx.. . . .	15
Post Pharyngeal abcess.. . . .	3
Inflammation of the stomach.. . . .	171
Ulceration of the stomach.. . . .	10
Hemorrhage of the stomach.. . . .	1
Dilatation of the stomach.. . . .	1
Indigestion.. . . .	48
Vomitting.. . . .	10
Gastralgia.. . . .	11

## Inflammation of the intestines—

Enteritis.. . . .	30
Typhilitis.. . . .	6
Colitis.. . . .	11
Appendicitis.. . . .	16
Duodenitis.. . . .	1
Intestinal obstruction.. . . .	5
Constipation.. . . .	21
Diarrhœa.. . . .	60
Fistula in ano.. . . .	6
Prolapsus of rectum.. . . .	1
Ulcer of rectum.. . . .	1
Piles.. . . .	34
Inflammation of the liver.. . . .	37
Jaundice.. . . .	9
Hernia.. . . .	47
Inflammation of hepatic ducts and gall bladder.. . . .	9
Calculi.. . . .	2
Biliary colic.. . . .	1
Inflammation of the peritoneum.. . . .	18
Dropsy.. . . .	1



TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10—*Continued.*

Diseases of the limphatic system—68—	
Inflammation of the limphatic glands.. . . .	64
Diseases of the thyroid body.. . . .	2
Goitre.. . . .	2
Diseases of the urinary system—101—	
Acute nephritis.. . . .	9
Bright's Disease.. . . .	48
Abcess perinephritis.. . . .	2
Calculi in kidney.. . . .	4
Calculi in ureter.. . . .	3
Heamaturia.. . . .	2
Albuminuria.. . . .	1
Lithuria.. . . .	2
Phosphaturia.. . . .	1
Inflammation of the bladder.. . . .	29
Diseases of the generative system—214—	
Urethritis.. . . .	6
Stricture of urethra.. . . .	24
Inflammation of the prostrate.. . . .	9
Phimosi.s.. . . .	12
Paraphimosis.. . . .	14
Inflammation of the glands.. . . .	3
Soft chancre.. . . .	4
Inflammation of the scrotum.. . . .	49
Inflammation of the spermatic cord.. . . .	12
Varicocele.. . . .	32
Inflammation of the testicles.. . . .	28
Epididymitis.. . . .	19
Cryptorchidism.. . . .	2
Diseases of the organs of locomotion—53—	
Inflammation of the bones—	
Osteitis.. . . .	2
Periostitis.. . . .	6
Caries.. . . .	2
Inflammation of the joints.. . . .	36
Dislocation of ankles.. . . .	6
Dislocation of spine.. . . .	1
Psoas, lumbar and other abscesses—46—	
Lumbago.. . . .	42
Sciatica.. . . .	1
Inflammation of bursea.. . . .	3
Diseases of the connective tissues—10—	
Cellulitis.. . . .	8
Abcess.. . . .	1
Gangrene.. . . .	1



## SESSIONAL PAPER No. 21

TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10—*Continued.*

## Diseases of the skin—104—

Erythema.. . . . .	3
Urticaria.. . . . .	1
Eczema.. . . . .	14
Herpes.. . . . .	1
Dermatitis.. . . . .	2
Acne.. . . . .	1
Seborrhea.. . . . .	2
Ulcer.. . . . .	13
Boils.. . . . .	46
Carbuncles.. . . . .	8
Whitlow.. . . . .	7
Onychia.. . . . .	2
Ringworm.. . . . .	1
Frostbite.. . . . .	3

## Injuries—691.

## General injuries—41—

Effects of heat.. . . . .	3
Burns and scalds.. . . . .	32
Multiple injury.. . . . .	1
Suffocation (drowning).. . . . .	3
Shock.. . . . .	2

## Local injuries—650—

Rupture of muscles.. . . . .	2
Wounds of muscles.. . . . .	4
Burns and scalds of skin.. . . . .	26
Wounds scalp.. . . . .	22
Fracture of vault of skull.. . . . .	2
Concussion of brain.. . . . .	3
Contusion of eyelid.. . . . .	2
Wound of eyelid.. . . . .	4
Wound of eyeball.. . . . .	3
Foreign bodies in nose and other cavities.. . . . .	2
Wound of neck.. . . . .	3
Wound of chest.. . . . .	1
Contusion of chest.. . . . .	2
Fracture of ribs.. . . . .	27
Sprain of back.. . . . .	7
Wound of back.. . . . .	4
Contusion of abdomen.. . . . .	1
Contusion of upper extremities.. . . . .	127
Sprain of shoulder.. . . . .	5
Sprain of elbow.. . . . .	3
Sprain of wrist.. . . . .	43
Sprain of hand.. . . . .	3
Wound of upper extremities.. . . . .	20
Fracture of clavicle.. . . . .	17
Fracture of scapula.. . . . .	9
Fracture of humerus.. . . . .	58



1 GEORGE V., A. 1911

TABULAR STATEMENT showing diseases for which seamen received treatment during  
1909-10—*Continued.*

Local injuries—Continued.

Fracture of radius.. . . . .	13
Fracture of ulna.. . . . .	22
Fracture of radius and ulna.. . . . .	28
Fracture of carpus, metacarpus and phalanges.. . . . .	4
Dislocation of humerus.. . . . .	22
Dislocation of phalanges and thumb.. . . . .	4
Contusion of lower extremities.. . . . .	19
Sprain of hip.. . . . .	10
Sprain of knee... . . . .	19
Sprain of ankle.. . . . .	57
Sprain of foot... . . . .	12
Fracture of femur.. . . . .	9
Fracture of patella.. . . . .	4
Fracture of tibia.. . . . .	15
Fracture of febula.. . . . .	4
Fracture of tibia and febula... . . . .	1
Fracture of bones of foot.. . . . .	3
Malingery.. . . . .	1
Vaccination.. . . . .	1
Incomplete reports.. . . . .	2

Total number of seamen treated—3,629.



APPENDIX No. 19.

SIGNAL SERVICE, CANADA.

The Deputy Minister, Marine and Fisheries,  
Ottawa.

SIR,—I have the honour to inclose herewith the annual report of the Signal Service, 1909-10.

I have the honour to be, sir,  
Your obedient servant,

HERBERT MCGREEVY,  
*Superintendent of Signal Service.*

SIGNAL STATIONS.

Name.	Description.
Montreal.. . . .	Telephone.
Longue Pointe.. . . .	"
Verchères.. . . .	"
Sorel.. . . .	"
Three Rivers.. . . .	"
Batiscan.. . . .	"
St. Jean Deschaillons.. . . .	"
Portneuf.. . . .	"
St. Nicholas.. . . .	"
Cap Rouge.. . . .	"
Quebec.. . . .	"
Grosse Isle.. . . .	Telegraph.
Crane Island.. . . .	Telephone.
L'Islet.. . . .	Telegraph.
Village des Aulnaies.. . . .	"
Rivière du Loup.. . . .	"
Father Point.. . . .	"
Little Métis.. . . .	"
Matane.. . . .	"
Cape Chatte.. . . .	"
Martin River.. . . .	"
Cape Magdalen.. . . .	"
Fame Point.. . . .	"
Cape Rosier.. . . .	"
Point Maquereau.. . . .	"
Cape Despair.. . . .	"
Point Escuminac.. . . .	"
West Point.. . . .	"
Southwest Point.. . . .	"
South Point.. . . .	"
Heath Point.. . . .	"
Bersimis.. . . .	"
Point des Monts.. . . .	"



SIGNAL STATIONS—*Continued.*

Name.	Description.
Point Amour.. . . . .	"
Belle Isle.. . . . .	"
Amherst Island.. . . . .	"
Cape St. Lawrence.. . . . .	"
St. Paul Island.. . . . .	"
Cape Ray.. . . . .	"
Flat Point.. . . . .	"
Cape Race.. . . . .	"

Montreal, Bersimis and Grosse Isle are stations for reporting vessels, not for signalling purposes.

SIGNAL SERVICE, 1909-10.

From April 1 to 25, 1909, bulletins were issued at Quebec, daily at 10.30 a.m., from April 26 to December 23, daily at 10 a.m. and 3 p.m., and from December 24, 1909, to March 31, 1910, daily at 10.30 a.m.

These bulletins contain information respecting ice and weather conditions, and movements of vessels. They were distributed, in Quebec, to the various parties interested in navigation. They were also telephoned to Montreal, and there given to the Shipping Federation, Board of Trade and others interested, by telephone. I think it would be advisable to issue these reports in Montreal and distribute them, as well as in Quebec.

During the season of navigation, the quarantine station at Grosse Isle and the pilot station at Father Point were informed daily of the movements of inward-bound vessels.

Weather and ice conditions were wired daily to Halifax and Sydney, during April and May, 1909, and March, 1910, also to the signal stations at Cape Ray and Cape Race from April 20 to May 31, 1909, for the benefit of inward-bound vessels inquiring for same.

Arrangements have been made to open a signal station at the Cape Salmon lighthouse. This station should prove of great value, being situated half way between Father point and Quebec. It will also be of much service to vessels from the Saguenay river, bound west.

Another station will be opened during the coming year at Money Point, Cape Breton, for the benefit of vessels bound to and from Sydney.

The old stone tower at Verchères has been leased for a period of five years, with the right of purchase. This tower is supposed to have been built in the latter part of the seventeenth century, and has a most interesting history, the main feature being its defence against the Iroquois, in 1692, by Mlle. de Verchères.

The building makes an ideal signal station.

The office of the signal service in Montreal was transferred in March, 1910, from the Harbour Commissioners' building to No. 223 Commissioners' street, where the Montreal agency of the Department of Marine and Fisheries is situated.

TELEPHONE SYSTEM.

This service, which extends from Montreal to Quebec over a private telephone line rented from the Bell Telephone Company, and from Quebec to Crane island over the public service line of the same company, has proved of great value, not only from a signal service point of view, but to the Department of Marine and Fisheries generally. In particular to the dredging fleet of the River St. Lawrence ship channel and to the lighthouse and buoy service.



## SESSIONAL PAPER No. 21

Previous to the inauguration of this service, it was not unusual for steamers, inward or outward bound, to have to wait several hours at Quebec for pilots, owing to the uncertainty as to the whereabouts of the different vessels expected. Now the pilots for above and below Quebec are kept constantly informed of the movements of all vessels on the river, with the consequence that no delays are incurred. The same may be said of the steamship agents, railway companies and others interested in the arrival of vessels, both at Montreal and Quebec.

## OPENING OF NAVIGATION.

## QUEBEC.

1909.

The steamer *Aranmore* left on April 4 for north shore points, going as far as Esquimaux point, and arrived back on the 13th.

The steamer *Bonavista*, from Sydney, arrived on April 21.

The steamer *Hero*, from Philadelphia, arrived on April 28.

The *Corinthian* arrived on April 29, the first transatlantic steamer of the season.

The first Royal mail steamer to arrive was the *Empress of Ireland*, on May 1.

The first vessel to leave for Montreal was the *Bonavista*, on April 23.

The first vessel to arrive from Montreal was the *Murray Bay*, of the Richelieu and Ontario Navigation Company, on April 25.

1910.

The steamer *General Wolfe* left on March 24 for Esquimaux point and intermediate points, and arrived back on the 30th.

The small steamer *Mahone* arrived from Seven islands on March 25.

## MONTREAL.

1909.

The *Longueuil*, of the Richelieu and Ontario Navigation Company, commenced running on April 16.

The *Bonavista*, from Sydney, arrived on April 23.

The first transatlantic vessel to arrive was the *Corinthian*, on May 1.

## CLOSING OF NAVIGATION.

## QUEBEC.

1909.

The last Royal mail steamer was the *Victorian*, which sailed on November 12.

The last of the regular transatlantic vessels were the *Montreal* and *Cairntorr*, on November 26.

The last steamer to leave port was the *Fornebo*, on December 4.

The last steamer to arrive from Montreal was the *C. Sundt*, on December 1.

The last vessel to arrive from below was the *Canada*, on December 4, from Gaspé.

## MONTREAL.

1909.

The last transatlantic vessels to sail was the *Montreal*, on November 26.

The last vessel to sail was the *C. Sundt*, on November 30.



## ICE.

## SPRING AND SUMMER, 1909.

The general ice conditions in the Gulf of St. Lawrence and Cabot straits were rather less severe than usual, and steamers were not hampered to any great extent after May 1. The last ice was seen in the Cabot straits on May 17.

The remarkable feature was the great number of bergs reported by the Cape Race station, and the very early date at which they appeared. As many as two hundred were counted in sight at the same time. The bergs were first seen in the beginning of April, and continued passing until the middle of August.

In the Strait of Belle Isle the field ice was heavy, and was seen in diminishing quantities until July 16.

As at Cape Race, bergs appeared very early and in very large numbers. The last was seen on September 7.

Above Quebec, the river was solid from Montreal to Quebec, owing to the ice-bridge having taken at Cap Rouge.

On April 3, owing to the work done by the C.G.S. *Montcalm*, the ice-jam at Cap Rouge was finally broken up. From that date the *Montcalm* continued working in the ice until the 16th, when it arrived at Three Rivers. In the meantime the *Lady Grey* had worked down from Sorel, and with the help of the *Montcalm* succeeded in opening up Lake St. Peter on April 17. The *Lady Grey* arrived in Montreal on April 19, the channel being then open from Montreal to Quebec.

## WINTER, 1910.

Ice conditions in the river and gulf of St. Lawrence were the most favourable for many years, and a very early opening of navigation is assured.

Ice, weather and wind conditions, and sealing news were collected from various points in the gulf during February and March, and wired to Halifax, Nova Scotia, and St. John's, Newfoundland, for the benefit of the sealing fleets.

Above Quebec, owing to the excessively mild winter, the ice conditions were very light.

From a little above Three Rivers down to Quebec the channel was open throughout the winter. From Montreal down, the river was frozen solid on December 26.

Two ice-jams occurred at the narrows below Cap Rouge, the first on January 19 about 7 p.m., and which was broken up the next day by the ice-breakers *Montcalm* and *Lady Grey*; the second on March 15 at 1 p.m., and which was broken up the same evening at 6.30 p.m.

The C.G.S. *Lady Grey* left Quebec on March 16 at 8.15 a.m., and arrived at Three Rivers at 3.45 p.m.

The C.G.S. *Montcalm* left Quebec on March 20 at 11 a.m., and arrived at Three Rivers at 5.50 p.m.

From the dates of their arrival at Three Rivers, the boats worked daily in the ice above, but up to March 31 had not succeeded in getting through to Sorel.

An interesting item of navigation was the running, throughout the winter, of the ferry steamer, a small summer boat, between Three Rivers and Ste. Angele de Laval.

## ITEMS OF NAVIGATION.

## 1909-10.

The C.G.S. *Montcalm* left Quebec on December 18 for Seven islands, and arrived back on December 23, 1909.

The C.G.S. *Montcalm* left Quebec on March 3, 1910, for Seven islands, and arrived back on March 6.



## SESSIONAL PAPER No. 21

The small steamer *Mahone*, during the winter of 1910, made a number of trips between Rivière du Loup wharf and Tadousac.

The first transatlantic steamer to take the Belle Isle route passed Point Amour outward bound on June 12, name unknown. The route was not generally used until after the first week in July. The first communication with Belle Isle was on June 24, when the Marconi station was opened.

Navigation was opened on the Saguenay river on May 8 by the steamer *Tadousac* of the Richelieu and Ontario Navigation Company.

The first transatlantic steamer to enter the Saguenay was the *Norden*, on May 15.

## SIGNALLING BY MARCONI WIRELESS TELEGRAPH SYSTEM.

Throughout the season of navigation, messages have been received from the different wireless stations, giving ice and weather conditions and movements of steamers.

The service given by this system was of great value, particularly during foggy weather.

Messages were transmitted with promptness and efficiency.

HERBERT MCGREEVY,  
*Superintendent Signal Service.*

## HALIFAX SIGNAL STATION.

SIR,—Please find inclosed herewith Shipping Report, stating number of vessels reported arrived and passed port of Halifax during the period from April 1, 1909. to the end of fiscal year, March 31, 1910.

I am, sir, yours obediently,

WM. WALKAM, Lieut., R.C.E.  
*Superintendent of Signals.*

To the Agent,  
Marine and Fisheries Department, Halifax.



CITADEL SIGNAL STATION.

RECORD OF SHIPPING, as per record folio, from April 1, 1909, to March 31, 1910.

1909-10	Men of War. British.			Men of War Foreign.			Steamers, 1st Class.			Steamers, 2nd Class.			Ships, Barques and Barquen- tines.			Brigs and Brigantines.			Schooners, 3 mts or bearing 1 <sup>st</sup> . Signal.			Monthly Total.		
	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.
April.....							52	52		48	48		3	3		2	2		7	7		112	112	
May ....	1	1					43	43		65	65		2	2					12	12		123	123	
June .....							48	47	1	78	78					1	1		10	9	1	137	135	2
July .....							52	52		63	63		1	1		2	2		11	11		129	129	
August....							55	53	2	82	82		1	1					8	8		146	144	2
September..				1	1		59	59		63	63		1	1					6	6		130	130	
October..							55	54	1	52	52								6	6		113	112	1
November..							57	56	1	53	53		1	1					4	4		115	114	1
December..							61	60	1	50	50								6	6		117	116	1
January...							55	54	1	40	40		1	1		1	1		2	2		99	98	1
February..							57	57		35	35		1	1					4	4		97	97	
March.....							62	62		45	45					2	2		5	5		114	114	
Totals...	1	1		1	1		656	649		7 674	674		11	11		8	8		81	80	1	1432	1424	8

Total vessels reported .. . . . . 1,432  
" arrived .. . . . . 1,424  
" passed..... 8

W. WALKAM, Lieut., R.C.E.,  
*Superintendent of Signals, Halifax, N.S.*

HALIFAX, N.S., April 2, 1910.

CAPE RACE, May 23, 1910.

SIR,—I am in receipt of yours of the 12th instant, and I beg to say that the duties performed by me as signal officer during the year are about the same as have been performed all the previous years, to signal all passing vessels and report them to their owners or agents as they wish.

I have also to report by telegram to Lloyds the name of every steamer that passes bound from Europe to Canada or the United States, and I fill monthly sheets for Lloyds with the names of all vessels that pass in the different directions during the month. I send two reports daily to Quebec on the condition of weather, and report the passing of steamers inward and outward, and also send condition of ice if any. All hands attend to the signal station in turn or when required.

I am, sir, yours respectfully,

J. MYRICK,  
*Keeper, Cape Race.*



## SESSIONAL PAPER No. 21

ST. PAULS ISLAND, May 24, 1910.

SIR,—Replying to your letter of the 12th instant, directing me to report to your office the duties performed by me as signal officer during the fiscal year ending March 31 last.

I beg to report as follows. I returned to this station from sick leave on May 6, 1909, and found the cable to the mainland broken. Had the station overhauled, new halyards rove, flags all taken out, dried and replaced.

May 26.—British steamer *Spleroid* signalled inward noon; replied, cable communications interrupted.

June 21.—British steamer *Philac* signalled inward 2.30 p.m.; replied, cable communications interrupted.

July 10.—British steamer *Portland* signalled outward 11.45; replied, cable communications interrupted.

July 18.—Read name on steamer *Ocland*, outward noon; did not signal.

August 28.—Cable repaired noon. Norwegian barque *Robert Scrafton* signalled inward 4 p.m.; reported to signal service.

September 12.—German barque *T.E.R.J.* signalled outward noon; reported to signal service.

October 27.—Read name on steamer *Urania* outward; did not signal.

December 1.—Cable broken. December 22, cable repaired.

June 12, 1910.—Lowered topmast and gaff, and unrove halyards for the winter.

From March 1 to 31.—Every clear day I climbed to the highest part of the island to observe the condition of the ice, and reported the same to the signal service, tri-weekly or daily as instructed.

Any time when a ship was seen approaching the island, I proceeded to the signal station, and remained there till she either signalled or it became evident she did not intend to do so.

I am, sir, your obedient servant,

JOHN M. CAMPBELL,  
*Superintendent, St. Pauls Island.*

FLAT POINT, May 15, 1910.

SIR.—I beg to inclose a summary of the duties performed as signal agent during the fiscal year ended March 31, 1910.

I am, sir, yours obediently,

JOHN G. PETERS.

## REPORT.

Flat Point signal station, N.S., April 1, 1909, to March 31, 1910, summary of duties performed.

March 10, 1909.—Instructed by superintendent of signal service to telegraph tri-weekly reports.

April 10, 1909.—Instructed telegraph two reports daily (Sundays included).

December 11, 1909.—Instructed to discontinue reports.

Number of first-class steamers reported inward, 811; barques, 5; barquentines, 12; brigantines, 21. Signals exchanged with inward or outward ships, 351. Names and time all vessels passed abeam of station were entered in official log-book.

Daily reports summarized and telegraphed Halifax papers.

Furnished Dominion Coal Company special reports of ice condition, winds, weather, and a report of time their steamers sighted, time abeam (day and night).



1 GEORGE V., A. 1911

Furnished Dominion Iron and Steel Company daily report of ice and weather conditions, also with a copy of gulf signal service ice report, April and May.

Signalled instructions to four Black Diamond steamers and one Elder Dempster liner to proceed elsewhere.

Signalled compass directions to four steamers requiring pilots.

Reported one vessel (*Myrtel V. Hopkins*) in distress, to Dominion Coal Company.

Telephoned gulf ice report, meteorological forecasts, velocity and direction of wind here to eight steamer captains.

Advised five steamers to remain in port on account of ice conditions or storms outside: *Fornebo*, *Louisburg*, *Kronprins Olav*, *Cape Breton* and *Fritzoe*.

Furnished Dominion Coal Company synopsis from log, giving weather, wind direction and velocity, ice conditions, duration fogs, ships inward and outward, name and time, for months of November, December, January and February, taking in for each year, from 1905 to 1909.

Furnished Nova Scotia Steel and Coal Company data, giving the maximum velocity recorded during gales, 1904 to 1908.

Number of steamers, giving names and registered tonnage, arriving at Sydney, 1909, was compiled for a New York dry dock construction company.

Miscellaneous data *re* tides, movements of steamers, ice, &c., was given pilots, yachtsmen and private parties by letter, telephone and telegraph.

JOHN G. PETERS.

To Acting Agent Marine and Fisheries,  
Halifax.

WESTPORT, May 16, 1910.

SIR,—My first duty is to go to the signal station in the morning and ascertain whether there are any ships, barques or steamers inward bound, and if any, to report at once to the signal officer at Custom House at St. John, N.B. This requires prompt attention at all hours of the day until sundown; secondly, to report to the agent at St. John when any of the gas buoys is out of position or the light is not burning; thirdly, to post weather forecasts twice per day at post office and custom house; fourthly, to hoist storm signals when notified, which often keeps one watching at the telephone until midnight; fifthly, generally when the boats are here for the purpose of placing buoys in position, I render service, as I am well acquainted with the bay and all the ledges surrounding the island; sixthly, when telegrams arrive for captains of Dominion Government steamers on station, I carry them off, and receive and bring all messages in return. Thus you see my duties are multifarious.

I am, sir, your most obedient servant,

F. J. MORRELL,  
*Signal Officer.*



SESSIONAL PAPER No. 21

## APPENDIX No. 20.

List of shipment of live stock shipped from Montreal during season of 1909-10.

Months.	Sheep.	Cattle.	Horses.	U. S. Cattle.
1909.				
May .....		14,173	2	2,212
June .....	452	10,243	17	2,352
July .....		14,152	12	627
August....	60	16,083	4	917
September..	1,104	15,837	13	924
October. ....		13,331	78	131
November....		10,495	142	64
	1,616	94,314	286	7,227

## FROM ST. JOHN, N.B.

Months.	Cattle.
1909.	
December .....	2,933
1910.	
January .....	400
February. ....	1,105
March .....	194
	4,632

United States cattle are included in 94,314.



1 GEORGE V., A. 1911

DIFFERENT Ocean Lines by which the Live Stock was shipped during the season  
1909-10, from Montreal.

Number.	Ocean line.
Allan Line.. . . . .	10,870
Athenia.. . . . .	3,456
British and North Atlantic.. . . . .	7,089
Cairn Line.. . . . .	12,669
Cassandra.. . . . .	4,335
C.P.R... . . . .	27,749
Donaldson.. . . . .	8,137
Dominion.. . . . .	3,515
Elder-Dempster.. . . . .	6
Leyland.. . . . .	1,209
Manchester.. . . . .	8,918
Manchester.. . . . .	8,918
Parthenia.. . . . .	3,857
Thomson.. . . . .	2,504
	<hr/>
	94,314

DIFFERENT Ocean Vessels by which the Live Stock was shipped during season 1909-10,  
from St. John.

Salacia.. . . . .	679
Montrose.. . . . .	431
Cassandra.. . . . .	176
Monmouth.. . . . .	548
Lakonia.. . . . .	16
Lake Michigan.. . . . .	711
Athenia.. . . . .	783
Montezuma.. . . . .	297
Montcalm.. . . . .	415
Manchester Mariner.. . . . .	99
Montreal.. . . . .	477
	<hr/>
	4,632

TOTAL Shipments of Live Stock from Canada to Ports in Great Britain.

From St. John, N.B.,  
Dec., 1909—

	Cattle.	Sheep.	Horses.
Glasgow.. . . . .	1,549		
London.. . . . .	836		
Bristol.. . . . .	548		
Jan., 1910—			
Manchester.. . . . .	99		
London.. . . . .	301		
Glasgow.. . . . .			10
Feb., 1910—			
London.. . . . .	603		
Glasgow.. . . . .	87		
Bristol.. . . . .	415		



## SESSIONAL PAPER No. 21

TOTAL Shipments of Live Stock from Canada to Ports in Great Britain—*Continued.*From St. John, N.B.—*Continued.*

Mar., 1910—

	Cattle.	Sheep.	Horses.
London.. . . . .	176		
Glasgow.. . . . .	4,632	....	12
Total.. . . . .	4,632	....	22

## From Montreal, Que., 1909-10:—

May, 1909—

Glasgow.. . . . .	1,750	....	12
Liverpool.. . . . .	6,537	....	1
London.. . . . .	3,660	....	9
Manchester.. . . . .	1,211		

June, 1909—

Glasgow.. . . . .	1,092	....	17
Liverpool.. . . . .	3,765	452	
London.. . . . .	4,238		
Manchester.. . . . .	1,148		

July, 1909—

Glasgow.. . . . .	3,248	....	12
Liverpool.. . . . .	5,128		
London.. . . . .	4,930		
Manchester.. . . . .	908		

Aug., 1909—

Glasgow.. . . . .	2,843		
Liverpool.. . . . .	5,939	....	2
London.. . . . .	6,692	60	
Manchester.. . . . .	869		

Sept., 1909—

Glasgow.. . . . .	2,369	....	13
Liverpool.. . . . .	6,051		
London.. . . . .	6,458		
Manchester.. . . . .	959		

Oct., 1909—

Glasgow.. . . . .	2,021		
Liverpool.. . . . .	5,599	893	
London.. . . . .	5,754		
Manchester.. . . . .	844		
South Africa.. . . . .	6	211	
Bristol.. . . . .		....	1

Nov., 1909—

Glasgow.. . . . .	2,110	....	12
Liverpool.. . . . .	1,953		
London.. . . . .	5,420	....	5
Manchester.. . . . .	912		

Total.. . . . .	94,314	1,616	84
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NOTE.—In October, 1909, 17 mules were shipped to South Africa; in November, 1909, 125 mules were shipped to South Africa.



1 GEORGE V., A. 1911

COMPARATIVE STATEMENT of the number of Cattle shipped from Canada to British ports from the years 1902-3 to 1909-10.

	SHEEP.			CATTLE.			HORSES.			TOTALS.		
	Montreal.	St. John.	Halifax.	Montreal.	St. John.	Halifax.	Montreal.	St. John.	Halifax.	Sheep.	Cattle.	Horses.
1909-10.....	1,616	Nil.	Nil	94,314	4,632	Nil.	286	Nil.	Nil.	1,616	98,946	286
1908-9.....	10,111	151	"	99,830	22,923	3,097	116	65	"	10,262	125,850	181
1907-8.....	11,585	4,168	"	96,977	20,210	Nil.	174	51	"	15,753	127,187	225
1906-7.....	10,791	1,371	"	128,160	31,148	"	661	57	"	12,162	159,308	718
1905-6.....	19,077	3,971	"	126,871	33,543	1,042	568	79	"	23,048	161,456	647
1904-5.....	49,422	17,283	"	108,553	33,833	745	279	213	"	66,715	143,131	492
1903-4....	57,741	23,428	1,475	133,594	25,855	5,456	361	31	31	82,644	164,905	423
1902-3 ....	61,017	19,310	426	147,201	37,453	3,856	373	115	17	80,753	188,510	503



SESSIONAL PAPER No. 21

## APPENDIX No. 21.

## SABLE ISLAND.

December 29, 1909.

To CHAS. H. HARVEY, Esq.,  
Agent Marine and Fisheries, Halifax.

SIR,—I beg to submit the following report for the year ending December 31, on equipment, repairs to buildings, patrol, and other information relating to the year's work.

## WRECKS AND CASUALTIES.

No known wrecks have occurred during the year. During August a French fishing dory injured, marked *St. Mals*, drifted ashore on the south side. Late in October about 15 bundles of cedar shingles and several dozen apples were picked up on south side. No marks on the shingles.

The wrecked steamship *Skilby*, lying on the north side, broke amidships in November; several plates on the starboard are started.

## BOATS AND APPARATUS.

An old surf boat of inferior model and the *Despatch* boat were sent off. The installation of the Marconi wireless station rendered the *Despatch* unnecessary.

A new surf boat of satisfactory model was received to replace the old one sent off. I again call your attention to the necessity of replacing the old lifeboat sent off some years ago from No. 4 station; also a lifeboat to replace the *Grace Darling*, 55 years old, at No. 3 station; a Beebe-McLellan boat would, I think, be suitable.

## PATROL.

The island was patrolled forty-four times in the morning and eight times at night.

## STAFF CHANGES.

James Ritcey, keeper of No. 3 station, resigned, and left the island. Stewart Glazebrook was appointed to succeed him.

## BUILDING AND REPAIRS.

*No. 1 Station.*—Concrete platform or pavement laid around three sides of superintendent's dwelling. Concrete wall under one end of horse stable and floor of concrete laid under nine horse stalls. Lookout repaired, and fitted with new topmast.

*No. 2 Station.*—Concrete water tank of 1,200 gallons capacity built, all repaired and altered. Roof of dwelling shingled south side.

*No. 4 Station.*—New lookout staff built, west end light; repairs to barn roof and cowl on light. East end light. Repair to barn roof.



1 GEORGE V., A. 1911

## FARMING.

A fair quantity of vegetables and hay were raised and stored, although the season was unusually dry.

*Live Stock on hand—*

- 65 head of cattle.
- 30 trained horses.
- 2 imported stallions.
- 5 imported mares.
- 5 hogs.
- 200 wild ponies.

*Stock Killed—*

- 9 beeves, weighing 6,775 pounds.
- 10 hogs, weighing 1,885 pounds.

*Shipped—*

- 1 despatch boat.
- 1 surf boat.
- 109 barrels cranberries.
- Salted hides.
- 32 wild ponies.

*Salved ex-SS. 'Skilby'—*

- 54 tons coal.

## Bedding and sailors' clothing on hand—

- 15 mattresses.
- 50 pairs blankets.
- 10 pillows.
- 30 spreads.
- 1 piece ticking.
- 16 jackets.
- 13 pairs pants.
- 11 vests.
- 20 shirts.
- 13 caps.
- 15 suits underclothing.
- 30 pairs brogans.
- 17 pairs socks.

## CENSUS.

*No. 1 Station.*—Superintendent, R. J. Boutiller and family, 3; Captain, Wm. Byrne; Cook, H. Howell; Super., J. Dunn; Boatmen, A. Nifort, M. Noonan, D. Trider, A. Whare, H. DeYoung—8.

*No. 2 Station.*—Keeper and Coxswain, R. Naugle and family—4.

*No. 3 Station.*—Keeper, Stewart Glazebrook and wife; Assistant, E. Osborne—3.

*No. 4 Station.*—Keeper and Chief of Staff, G. Soderburg and wife; Assistants, George Malaly, A. Naugle—4.

*West End Light.*—Keeper, A. J. Horne and family; Assistant, Jas. Horne—6.

*East End Light.*—Keeper, John Gregoire and family; Assistant, H. Naugle—6.

*Marconi Wireless Telegraph Station.*—Chief, J. D. Taylor; Operators, D. Feenell, P. Healey, —Rabbitts; Cook, W. White—5.

Total—39.

Your obedient servant,

R. J. BOUTILLIER,  
*Superintendent, Sable Island.*



SESSIONAL PAPER No. 21

## APPENDIX No. 22.

STATEMENT giving Names of Stations and Lightkeepers, &amp;c., in the Dominion of Canada.

## PRINCE EDWARD ISLAND.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Alberton Range. . . . .	William Champion. . . . .	Oct. 25, 1907. . . . .	130 00
Annandale . . . . .	Alfred Robertson. . . . .	" 6, 1898. . . . .	110 00
Block House. . . . .	A. S. McNeil. . . . .	Mar. 25, 1901. . . . .	400 00
Brighton Range. . . . .	Francis W. Hughes. . . . .	Apr. 1, 1909. . . . .	240 00
Brush Wharf. . . . .	D. W. McPherson. . . . .	Jan. 13, 1899. . . . .	80 00
Crapaud, Outer. . . . .	Abner J. Howatt. . . . .	July 22, 1893. . . . .	130 00
" Inner. . . . .	James Inman. . . . .	Aug. 13, 1901. . . . .	130 00
Cardigan River. . . . .	John W. Morrison. . . . .	" 15, 1901. . . . .	100 00
Cape Bear. . . . .	Luther Jordan. . . . .	Apr. 12, 1905. . . . .	400 00
Cape Egmont. . . . .	Jos. J. D. Gallant. . . . .	Oct. 21, 1902. . . . .	285 00
Cape Tryon. . . . .	William Bell. . . . .	Mar. 17, 1905. . . . .	285 00
Cove Head Range. . . . .	John A. Kielly. . . . .	Nov. 27, 1890. . . . .	100 00
Darnley Range . . . . .	Geo. W. Wiggins. . . . .	Oct. 16, 1896. . . . .	150 00
Darnley basin . . . . .	Chas. Taylor. . . . .	June 14, 1897. . . . .	80 00
East Point. . . . .	L. R. J. McDonald. . . . .	Jan. 18, 1901. . . . .	800 00
Fish Island. . . . .	Patrick Gould. . . . .	Dec. 7, 1906. . . . .	285 00
Georgetown, Inner. . . . .	Jesse G. Clark. . . . .	Aug. 14, 1901. . . . .	150 00
Georgetown Railway Wharf. . . . .	John Westaway. . . . .	Jan. 16, 1906. . . . .	130 00
Grand River East, Lot 56. . . . .	Alfred Robertson. . . . .	Oct. 5, 1898. . . . .	130 00
Grand Tracadie. . . . .	J. W. McDonald. . . . .	May 24, 1901. . . . .	130 00
Hazard, Inner Range. . . . .	Angus Beaton. . . . .	Nov. 21, 1902. . . . .	80 00
" Outer Range . . . . .	Daniel McRae. . . . .	Apr. 6, 1900. . . . .	80 00
Indian Point. . . . .	J. S. Allen. . . . .	May 18, 1898. . . . .	400 00
Little Channel. . . . .	William Hardy. . . . .	" 26, 1875. . . . .	130 00
Murray Harbour, Inner. . . . .	Robert Penny. . . . .	Nov. 11, 1897. . . . .	75 00
" Outer. . . . .	Lemuel McLeod. . . . .	Dec. 21, 1897. . . . .	75 00
Miminegash, Inner. . . . .	Elijah Costain. . . . .	May 18, 1906. . . . .	75 00
" Outer. . . . .	Patrick O'Brien. . . . .	" 14, 1897. . . . .	80 00
New London . . . . .	James H. McLeod. . . . .	Jan. 29, 1896. . . . .	150 00
North Cape. . . . .	James Phee. . . . .	Sept. 4, 1897. . . . .	360 00
North Rustico. . . . .	Jos. N. Pino. . . . .	Feb. 6, 1897. . . . .	150 00
Orwell. . . . .	John McDonald. . . . .	June 25, 1879. . . . .	80 00
Pointe Prim. . . . .	Alex. McRae. . . . .	Dec. 10, 1897. . . . .	300 00
Panmure. . . . .	Colin Steele. . . . .	June 3, 1901. . . . .	400 00
" E. A. . . . .	Mathias Condon. . . . .	Aug. 4, 1908. . . . .	380 00
Sandy Island, (Cascumpec) . . . . .	Jas. C. Tuplin. . . . .	May 5, 1897. . . . .	360 00
Savage Harbour. . . . .	Jas. A. McDonald. . . . .	July 11, 1889. . . . .	130 00
Sea Cow Head. . . . .	M. P. O'Roneghan. . . . .	Apr. 21, 1873. . . . .	330 00
Souris, East. . . . .	John D. Lavie. . . . .	June 23, 1905. . . . .	345 00
Summerside Wharf . . . . .	John Fraser. . . . .	Apr. 12, 1897. . . . .	130 00
Summerside Range . . . . .	George W. Bell. . . . .	Apr. 10, 1909. . . . .	80 00
St. Andrew, Point. . . . .	George Connor. . . . .	June 3, 1901. . . . .	150 00
St. Peters Island. . . . .	James W. Taylor. . . . .	May 1, 1897. . . . .	400 00
St. Peters harbour. . . . .	Albert Anderson. . . . .	July 25, 1900. . . . .	150 00
Tignish Run. . . . .	Agapè Gaudet. . . . .	Aug. 30, 1897. . . . .	150 00
Warren Farm Range. . . . .	A. S. McNeil. . . . .	May 16, 1907. . . . .	100 00
West Point. . . . .	William McDonald. . . . .	Jan. 22, 1876. . . . .	360 00
Wood Island. . . . .	Roderick W. McKay. . . . .	Apr. 11, 1899. . . . .	395 00
Wood Island Range. . . . .	James Young. . . . .	Nov. 14, 1902. . . . .	100 00
Wrights Range. . . . .	Charles Wright. . . . .	June 14, 1894. . . . .	130 00



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NOVA SCOTIA.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.	
			\$	cts.
Abbott Harbour. ....	W. H. D'Entremont.....	May 22, 1888..	100	00
Advocate Harbour.....	John H. Morris. ....	Aug. 10, 1904..	300	00
Amet Island .....	Lloyd Rogers.....	Nov. 11, 1902..	460	00
Amherst Harbour Range .....	William Shea.....	May 21, 1908..	180	00
Amherst Pt. Wharf .....	W. A. Downie.....	" 3, 1909..	60	00
Annapolis Wharf, Town of Annapolis.....	Jos. McMillan.....	Mar. 1, 1908..	100	00
Annapolis.....	Jos. McMillan.....	" 1, 1908..	100	00
Apple River Light and Fog Alarm.....	Hill E. Elderkin.....	" 31, 1905..	800	00
Argyle.....	Chas. A. Amiro.....	Feb. 6, 1893..	460	00
Arichat.....	Cap. Wm. Lavashe.....	Oct. 17, 1898..	325	00
Arisaig.....	Hugh R. McAdam.....	Nov. 14, 1898..	130	00
Avon River Bridge .....	Windsor E. Lt. Co.....	Oct. 13, 1892..	200	00
Baccaro .....	Wm. L. Smith .....	Jan. 9, 1907..	485	00
Barrington Lightship .....	Capt. Jno. H. Lyons....	June 18, 1897..	850	00
Battery Point.....	Henry Naas.....	Mar. 12, 1897..	385	00
Bear River.....	Wm. Hunt.....	Apr. 10, 1905..	180	00
Beaver Harbour.....	L. G. Cameron.....	Feb. 15, 1902..	150	00
Beaver Island S. E. ....	Theo. Sampson.....	Oct. 13, 1892..	100	00
Bear Island.....	Michael O'Brien....	Dec. 7, 1906..	300	00
Beaver Island, Lt & F. A. ....	W. E. O'Leary.....	Feb. 22, 1900..	800	00
Belliveau Cove.....	J. H. Belliveau.....	" 16, 1889..	100	00
Betty Island.....	P. E. Christian.....	June 29, 1904..	530	00
Biglow Pt.....	Earnest Mitchell..	Mar. 31, 1909..	100	00
Bird Island .....	H. C. McKay.....	May 21, 1901..	460	00
Black Rock .....	Chas. Robinson.....	Mar. 16, 1885..	360	00
Black Rock Point .....	M. D. Morrison.....	June 8, 1892..	300	00
Boars Head. ....	F. Ruggles.....	May 24, 1901..	400	00
Bass River. ....	David Vance.....	Oct. 24, 1907..	100	00
Borden Wharf.....	Fredk. Clarke .....	May 1, 1904..	110	00
Bon Portage .....	Angus Greenwood .....	Jan. 14, 1907..	425	00
Briar Island Light.....	J. N. Peters.....	June 6, 1901..	460	00
Briar Island Fog Alarm .....	B. H. Morrell.....	June 6, 1901..	500	00
Brooklin Pier .....	Howard Godfrey.....	Feb. 6, 1885..	80	00
Bunker's Island .....	F. H. Doane.....	July 27, 1904..	425	00
" North End.....	Jas. H. Schoville .....	Jan. 16, 1907..	240	00
Budget .....	Freeman Pride.....	Dec. 7, 1905..	240	00
Burnt Coat.....	Wm. Y. Falkner.....	June 22, 1898..	300	00
Bourgeois Inlet .....	Marian Burke .....	Dec. 1, 1902..	80	00
Campbells Island .....	John A. McDonald.....	Feb. 16, 1907..	150	00
Candlebox Island .....	Benjamin Leblanc.....	Nov. 1, 1892..	385	00
Canso Harbour and False Passage.....	Joseph Long.....	Dec. 31, 1896..	385	00
Canso Harbour Range.....	Wm. J. Mathews....	Dec. 17, 1904..	240	00
Cape D'Or Fog Alarm.....	F. H. P. Dewis.....	April 13, 1898..	800	00
Cape Fourchu Light and Fog Alarm.....	T. S. Doane.....	Dec. 31, 1904..	960	00
Cape George.....	John Murray.....	Nov. 3, 1882..	265	00
Cape La Ronde.....	John J. Mauger.....	Nov. 16, 1898..	385	00
Cape North, Lt & F. A. ....	Norman McLeod.....	Oct. 14, 1899..	400	00
Cape Rosebay Light and Fog Alarm.....	John L. McKenna ..	Mar. 31, 1899..	960	00
Cape Sable " "	Arthur Cunningham.....	July 16, 1902..	960	00
Cape Race " "	John Myrick.....	Nov. 1, 1897..	2,000	00
Cape St. George.....	Alex. L. McEachern .....	Sept. 8, 1898..	460	00
Cape St. Laurence.....	Chas. Jamieson.....	Sept. 21, 1893..	460	00
Cape St. Mary.....	Benj. H. Robichaud.....	July 5, 1886..	400	00
Cape Sharpe.....	Freeman Yorke.....	June 30, 1902..	800	00
Canning River, Inner.....	Fred Clarke .....	April 29, 1902..	110	00
" Outer.....	Fred W. Bishop .....	April 29, 1904..	130	00
Caribou Island.....	D. Falconer.....	Dec. 20, 1902..	385	00
Carter Island.....	Robert McDonald.....	Jan. 4, 1886..	325	00
Caveau Point Range. ....	Germain Chiasson....	Aug. 20, 1897..	180	00
Charlo Cove Light, F. & B. ....	Stephen C. Richard. ....	Nov. 4, 1901..	180	00
Chebucto Head Light and Fog Alarm....	Capt. Richard Holland.....	Oct. 1, 1906..	960	00
Chester, East, Ironbound.....	Uriah Young.....	Feb. 15, 1884..	485	00
Chéticamp .....	Marcelin Muise.....	Nov. 27, 1896..	360	00



SESSIONAL PAPER No. 21.

STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NOVA SCOTIA—Continued.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Chéticamp Range.....	Philip Burgeois.....	May 23, 1898..	180 00
Church Point.....	J. H. Saulnier.....	Aug. 8, 1878..	200 00
Clarke Cove Range.....	Roderick McDonald.....	Apr. 2, 1904..	130 00
Coffins Island.....	James E. Wentzell.....	June 2, 1909..	330 00
Cold Spring Head.....	Willard Vanenburg.....	Oct. 6, 1909..	150 00
Cole Harbour.....	Wm. M. Munro.....	April 23, 1907..	75 00
Cole Harbour Range.....	Geo. C. Jamieson.....	Oct. 21, 1898..	180 00
Country Harbour.....	Henry Burke.....	June 11, 1902..	460 00
Cranberry Island Light and Fog alarm ..	James P. Hanlon.....	April 10, 1905..	960 00
Crichton Head.....	H. H. Crichton.....	May 6, 1874..	240 00
Cross Island Light and Fog alarm ..	W. H. Wynacht.....	April 13, 1893..	960 00
Croucher Island.....	Geo. Croucher.....	Jan. 31, 1883..	360 00
Crotch.....	C. J. O. Hanley.....	May 6, 1906..	200 00
Dartmouth.....	Wm. Patterson.....	June 3, 1903..	130 00
Devil Island Range, Ft and Bk.....	W. G. Fulker.....	May 3, 1886..	510 00
Dimock Point .....	Windsor E. Lt. & Power Co.....		130 00
Digby Pier Pole.....	Edwin Beaman.....	May 29, 1897..	100 00
Dog Island.....	Simon Joyce.....	July 4, 1884..	180 00
Dover Harbour.....	Edward Morash.....	Oct. 1, 1906..	240 00
Duffus Point, inner.....	Alex. Fraser.....	Jan. 13, 1903..	130 00
" outer.....	M. McLean.....	" 13, 1903..	125 00
Economy Pole.....	Ingersoll L. McLellan.....	May 16, 1899..	65 00
Egg Island.....	Howe H. Stoddard.....	Mar. 23, 1909..	475 00
Eddy Point.....	Edward Mundell .....	July 28, 1903..	485 00
Flat Point Light and Fog alarm.....	Thos. O'Neil.....	May 2, 1904..	500 00
" .....	C. N. Peters.....	Mar. —, 1910..	460 00
Flint Island Light and Fog alarm.....	Michael Brean.....	Aug. 20, 1904..	460 00
Fourchu Head, Light.....	Geo. Hardy.....	June 16, 1909..	120 00
Fort Point.....	J. E. Misener.....	May 16, 1896..	205 00
Freestone Islet.....	Michael Sampson.....	" 11, 1907..	180 00
Fisherman Harbour.....	Théodore Beiswanger.....	Dec. 8, 1905..	180 00
Gabarouse .....	Jas. McDonald.....	Nov. 22, 1890..	195 00
Gilbert Point.....	Jos. W. Melanson.....	Aug. 18, 1894..	300 00
George Island Light and Fog Bell.....	Robt. Ross.....	Jan. 18, 1876..	325 00
Gillis Point .....	Hector McLean (M's. son)...	Dec. 18, 1897..	180 00
Glasgow Point.....	Abram Clory.....	July 25, 1894..	180 00
Grande Digue.....	D. A. Kaulback.....	Feb. 17, 1908..	60 00
Grand Etang.....	Séverin B. LeBlanc.....	Mar. 25, 1905..	80 00
Grand Passage, Briar Island.....	Chas. Buckman.....	Jan. 7, 1901..	325 00
Great Bras d'Or Range Fr. ..	Alex. Fraser.....	May 13, 1903..	130 00
" .....	B. Malcolm McLean.....	" 13, 1903..	125 00
Green Cove .....	A. J. Sallow.....	Dec. 28, 1900..	205 00
Granville Centre.....	Henry Rooney.....	Feb. 24, 1904..	95 00
Green Island (Arichat).....	Wm. A. Duann.....	May 12, 1903..	530 00
Green Island (Mahone Bay).....	M. B. Pearl .....	Sept. 1, 1908..	510 00
Gull Rock.....	L. D. Orchard.....	Jan. 1, 1877..	485 00
Guion Island.....	James W. Hardy.....	" 30, 1903..	510 00
Glace Bay Range F .....	Michael McNeil.....	Nov. 19, 1907..	95 00
" " B.....	Angus McFarlane.....	" 19, 1907..	95 00
Guysboro .....	Moses C. Scott.....	April 19, 1884..	300 00
Harbour au Bouche.....	Capt. Patrick Webb.....	Feb. 19, 1896..	300 00
Herring Cove.....	Wm. Brackett .....	Aug. 28, 1897..	130 00
Henry Island .....	D. A. McLennan.....	" 1, 1907..	460 00
Highland Village.....	W. A. Hennessy.....	May 6, 1905..	65 00
Hobson Island .....	John D. Smeltzer.....	April 10, 1900..	360 00
Horton Bluff.....	Mine S. M. Rathburn.....	Sept. 3, 1879..	300 00
Hubbard Cove.....	Albert S. Coolin.....	Oct. 31, 1903..	300 00
Harbour Island.....	Chas. G. Hodgson.....	June 16, 1908..	345 00
Indian Harbour.....	Henry Boutilier.....	" 6, 1901..	180 00
Ingonish Island.....	Robt. F. Warren.....	Sept. 17, 1903..	400 00
" Harbour.....	Geo. A. Hines.....	April 17, 1909..	150 00



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NOVA SCOTIA—Continued.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Isaacs Harbour.....	Ira L. Griffin.....	Apr. 28, 1894..	265 00
Isle au Haute.....	Percy E. Morris.....	Aug. 2, 1904..	530 00
Iona.....	F. X. S. McNeil.....	Nov. 16, 1901..	130 00
Jeddore Rock.....	John W. Mitchell.....	Sept. 29, 1882..	460 00
Jeddore Harbour Range.....	Jeremiah Harpell, ju.....	Jan. 21, 1901..	240 00
Jerome Point.....	Kenneth McAskill.....	July 30, 1901..	325 00
Jerseyman Island.....	Alphonse Thériault.....	" 1, 1905..	385 00
Jordan Pier.....	John Frederick.....	Dec. 19, 1906..	130 00
Kidston Island.....	Donald McRae.....	May 17, 1892..	240 00
Kingsport.....	C. H. Huntley.....	June 30, 1890..	110 00
Ketch Harbour.....	Chas. Martin.....	May 19, 1905..	100 00
L'Ardoise Range.....	M. J. Sampson.....	June 6, 1909..	50 00
" ".....	Thos. Brymer.....	" 6, 1909..	50 00
Lahave.....	W. H. Palmer.....	May 22, 1878..	265 00
Lingan Head.....	John Walsh.....	July 4, 1904..	240 00
Liscomb.....	James S. Hemlow.....	Jan. 2, 1908..	385 00
Little Dyke.....	S. Stewart.....	May 1, 1906..	65 00
Little Hope.....	Capt. Almon Doggett.....	Oct. 22, 1901..	745 00
Little Loraine Harbour.....	Patrick Gallant.....	Jan. 19, 1900..	120 00
Little Narrows.....	Alex. W. Ross.....	May 23, 1902..	150 00
Liverpool Dolphin & Bridge.....	Town of Liverpool.....		30 00
Louisbourg.....	Philip Price.....	Nov. 8, 1897..	350 00
Louisbourg Harbour Range.....	Thomas Connington.....	Oct. 6, 1897..	240 00
Louisbourg Fog Alarm.....	D. A. Campbell.....	Mar. 20, 1902..	920 00
Low Point Fog Alarm.....	Thos. O'Neil.....	May 2, 1904..	500 00
Mabou Outer.....	E. Doyle.....	June 14, 1897..	80 00
" Inner.....	Roderick McLean.....	Dec. 7, 1906..	70 00
Mainadieu.....	John Pope.....	Sept. 11, 1902..	385 00
Maitland Wharf.....	Harold Mckenzie.....		50 00
Margaree.....	John A. McRae.....	Feb. 28, 1907..	460 00
Margaree, Harbour Inner.....	Miles A. Dunn.....	June 8, 1901..	70 00
" " Outer.....	R. McLellan.....	May 12, 1903..	70 00
Margaretville.....	Capt. W. W. Gaucher.....	Mar. 12, 1909..	180 00
Mary Joseph.....	John Baker.....	" 22, 1909..	365 00
Marjories, Island.....	Michall McDonald.....	Sept. 22, 1909..	100 00
Masstown Pole.....	G. W. Vance.....	June 29, 1898..	60 00
Maugers Beach Light and Front Light.....	Wm. Icton, sr.....	July 6, 1903..	800 00
Meteghan River.....	L. C. Comeau.....	Oct. 12, 1875..	130 00
Mitcheners Point.....	William Currie.....	June 15, 1908..	180 00
Medway Head.....	Wm. Atkins.....	Nov. 22, 1909..	248 00
Moser Island.....	Samuel Moser.....	Nov. 6, 1885..	385 00
Mullin's Point.....	James Mullins.....	June 8, 1892..	240 00
Munro Point.....	Malcolm Buchanan.....	Oct. 25, 1905..	150 00
McKenzies Point.....	Donald McAulay.....	Aug. 24, 1909..	150 00
Musquodoboit, Harbour Range 'B'.....	( Arch. M. Kent.....	Apr. 29, 1904..	110 00
" " " 'F'.....	( Fred. Kent, assistant.....	Mar. 11, 1908..	50 00
McNeil's Beach.....	Jeremiah Kent.....	Apr. 29, 1904..	130 00
McMillans Point.....	Lauchlin McNeil.....	Aug. 6, 1884..	80 00
McNab's Island.....	John B. Chisholm.....	Dec. 2, 1905..	205 00
Naastown.....	Mathew Lynch.....	June 23, 1905..	360 00
North East Harbour Range.....	C. W. Vance.....	" 29, 1898..	65 00
Negro Island.....	Levi Perry.....	June 17, 1899..	250 00
Neil Harbour.....	Byron Nickerson.....	July 26, 1897..	385 00
North Canso.....	A. A. Buchanan.....	Aug. 14, 1899..	180 00
Noël.....	Robie McKay.....	Feb. 4, 1882..	360 00
Ouitique Island.....	Geo. C. Davidson.....	Apr. 25, 1906..	125 00
Parker Cove.....	Fred. A. Burke.....	Feb. 16, 1907..	425 00
Page Island.....	Thomas Milner.....	Aug. 1, 1909..	100 00
Parrsboro'.....	Alfred M. Powell.....	Dec. 5, 1905..	265 00
Pease Island.....	William Pettis.....	" 6, 1888..	425 00
Peggy Point.....	Thos. Baker.....	May 19, 1879..	425 00
Pennant.....	Sydney H. Garrison.....	Dec. 22, 1902..	400 00
	P. A. Gray.....	June 30, 1903..	130 00



SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NOVA SCOTIA—Continued.

Name of Station.	Name of lightkeeper.	Appointed.	Salary.
			\$ cts.
Petite de Grat.....	E. Landry.....	Feb. 23, 1897..	240 00
Pictou Bar.....	Wm. Munro.....	Nov. 22, 1890..	460 00
Pictou Custom House.....	Chas. Bone.....	June 14, 1907..	100 00
Pictou Island, East end.....	Andrew McFarlane.....	" 8, 1892..	460 00
Pictou Island Pier, West end.....	Chas. D. Patterson.....	Mar. 29, 1905..	460 00
".....	Hugh McLean.....	June 24, 1905..	100 00
Pictou Harbour Range.....	David Lowden.....	July 12, 1897..	225 00
Piper Cove.....	John C. McNeil.....	Dec. 18, 1897..	150 00
Pointe Aconi.....	John Charles Bonner.....	Nov. 6, 1903..	240 00
Point Edward Front.....	J. B. Rudderham.....	Jan. 15, 1905..	300 00
" Back.....	A. J. Lewis.....	May 22, 1905..	180 00
Pointe Prim Light, Fog Alarm, Digby.....	W. E. Ellis.....	Mar. 8, 1875..	960 00
Pointe Tupper.....	Duncan Gillis.....	Apr. 1, 1906..	360 00
Pomquet Island.....	M. Murphy.....	Dec. 18, 1890..	400 00
Porter Point.....	F. W. Bishop.....	April 29, 1904..	130 00
Port au Pique.....	Sam Creelman.....	May 2, 1901..	65 00
Port Bickerton.....	Theodore O'Hara.....	Jan. 26, 1901..	205 00
Port Felix.....	W. C. Boudrot.....	July 16, 1902..	300 00
Port George.....	Geo. M. Foster.....	Nov. 19, 1897..	130 00
Port Greville, Range.....	Ernest A. Hatfield.....	June 29, 1908..	240 00
Pope Harbour.....	Jas. Bollong.....	Aug. 6, 1877..	360 00
Port Hood.....	J. Allan McDonald.....	May 10, 1890..	300 00
Port Hebert.....	Watson Burgess.....	July 26, 1892..	180 00
Port Mouton.....	J. Oscar Campbell.....	April 29, 1898..	385 00
Port Maitland.....	A. J. Sallows.....	Dec. 28, 1900..	205 00
Port Medway.....	Wm. P. Atkins.....	Nov. 22, 1909..	240 00
Port Medway Harbour.....	Samuel T. Foster.....	Feb. 17, 1899..	100 00
Port Lorne.....	George D. Corbett.....	May 31, 1904..	300 00
Port Wade.....	Chas. Slocum.....	Feb. 1909..	50 00
Poulamon.....	Bartholomew Boudrot.....	Dec. 7, 1904..	265 00
Pubnico.....	Geo. D. Amero.....	Feb. 6, 1893..	370 00
Pugwash.....	Murdock McLeod.....	Dec. 10, 1897..	360 00
Queensport.....	W. E. Ehler.....	Aug. 13, 1906..	385 00
Quaker Islands.....	Edward Fader.....	Feb. 9, 1910..	*360 00
Red Island.....	John P. Campbell.....	Nov. 30, 1901..	130 00
Redman Head.....	John Croft.....	1908..	150 00
*Sable Island Humane Station.....	R. J. Boutillier, supt.....	Nov. 13, 1884..	700 00
St. Ann Harbour.....	Alex. Nicholson.....	June 5, 1905..	180 00
†St. Pauls Island.....	John M. Campbell, supt.....	Sept. 21, 1908..	700 00
St. Esprit.....	Alex. W. Finlayson.....	April 12, 1905..	510 00
St. Paul Island West Point.....	Archur Buchanan.....	Sept. 11, 1910..	400 00
St. Paul Island Fog Alarm.....	M. J. McLeod.....	July 10, 1906..	500 00
St. Paul Island, N.E. Point.....	Wm. Giles.....	Oct. 25, 1907..	400 00
Salter's Head.....	Caleb Smith.....	June 21, 1888..	80 00
Sambro Light and Fog Alarm.....	Alfred Gilkie.....	Jan. 8, 1867..	800 00
Sambro Harbour Light.....	John H. Findlay.....	Dec. 7, 1899..	130 00
Sambro Inner Island Light.....	Ephraim Smith.....	Jan. 3, 1900..	130 00
Scattarie Light and Fog Alarm.....	John T. Martell.....	July 30, 1897..	1,200 00
Seal Island Light and Fog Alarm.....	John Crowell.....	Oct. 14, 1899..	960 00
Seal Island Pole Light.....	Simon Joyce.....	July 4, 1884..	180 00
Shafners Point.....	Jacob V. Roblee.....	May 29, 1897..	180 00
Sheet Rock.....	Samuel Kenny.....	June 2, 1909..	475 00
Sheet Harbour Passage.....	James Wambolt.....	May 11, 1887..	75 00
Sand Spit (Shelburne Harbour),.....	Jas. G. Stephens.....	Mar. 11, 1903..	325 00
Ship Harbour.....	Howard Palmer.....	Feb. 6, 1906..	325 00
Shule Harbour.....	Capt. Clifford Patterson.....	Oct. 28, 1905..	200 00
Si-siboo.....	Jas. Amirault.....	July 11, 1899..	240 00
Spencers Island.....	Baxter McLellan.....	July 21, 1904..	130 00
Spencers Point.....	R. A. Spencer.....	April 1, 1870..	130 00
Steven Point Range.....	Hugh Clark.....	Mar. 31, 1909..	100 00

\* With board for self, family and assistants and allowance for salaries of staff. † With 5 boatmen at \$32 per month. \*\* With \$25 for blowing fog horn.



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NOVA SCOTIA—Concluded.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Stoddart Island .....	Ephraim Larkin .....	Mar. 18, 1806..	265 00
Sydney Bar .....	George Nunn....	June 20, 1872..	345 00
Sydney Range Fr. ....	J. B. Rudderham.....	Jan. 15, 1905..	300 00
" B. ....	B. A. J. Lewis..	May 22, 1905..	180 00
Terrence Bay .....	Samuel P. Slaunwhite. . .	Oct. 13, 1903..	130 00
Three Top Island.....	W. L. Munroe .....	" 28, 1879..	360 00
Tor Bay .....	Jas. M. Webber .....	May 10, 1898..	360 00
Troop Point.....	Ralph Troop.....	Jan. 23, 1906..	130 00
Tusket River.....	Severin Leblanc.....	July 28, 1899..	300 00
Victoria Beach. ....	James Hinds.....	Mar. 7, 1901..	130 00
Wallace Harbour.....	George Boyle..	July 13, 1903..	180 00
Walton Harbour . . .	Lewis E. Burgess.....	" 13, 1903..	180 00
Wedge Island .....	Wm. R. Church.....	Mar. 27, 1907 .	535 00
West Head Sable Island Cape.....	Wm. B. Smith, jr.....	April 12, 1890..	240 00
West Ironbound Island.....	Howard M. Wolf. ....	June 22, 1895..	360 00
West Arichat Range, Front Station. . .	Michael Gerrior.....	Sept. 1, 1904..	100 00
" " Back Station.....	Edward Delory.....	" 1, 1904..	100 00
Westhaver Island.. .	Alfred Strum.....	" 25, 1888..	240 00
Westport .....	E. W. Suthern.....	April 12, 1890..	425 00
Whitehead .....	Capt. Jas. Wells.....	Oct. 20, 1897..	555 00
Whycocomah.....	Murdock Matheson.....	Sept. 11, 1884..	80 00
Woods Harbour .....	Jas. E. Goodwin.....	Aug. 27, 1900..	265 00
Wolfville .....	J. L. Franklin.....	April 4, 1902..	130 00
Wolf Point.....	Howard Palmer.....	Oct. 14, 1899..	250 00
Yarmouth Harbour Corner Beacon.....	C. J. O'Hanly.....	May 6, 1905..	200 00

NEW BRUNSWICK.

Andersons Hollow Light .....	Aaron B. Copp.....	Mar. 30, 1903..	155 00
Beaver Harbour.....	J. Melvin Eldridge.....	May 2, 1904..	325 00
Beacon (St. John Harbour).....	A. F. Shepherd.....		*380 00
Bliss Island.....	James H. McLeod.....	Oct. 17, 1900..	485 00
Bathurst ..	Geo. C. Sutherland .....	Mar. 20, 1882..	240 00
Belyeas Point .....	Mrs. Westfield Day.....	Nov. 21, 1906..	100 00
Baie du Vin.....	John McLeod.....	Jan. 1, 1910..	180 00
Buctouche Beacon .....	H. B. Robicheaud.....	June 21, 1884..	180 00
" Bar .....	Jadus P. Cormier.....	July 26, 1902..	240 00
Big Duck Island Fog Alarm.....	Rupert Burnham .....	June 25, 1906..	700 00
Bridge Point Light.....	Harry Upton.....	Mar. 14, 1910..	80 00
Belle Isle (Hatfields Landing) .....	Thos. W. Spragg.....	June 27, 1903..	100 00
Bellony Point.....	Edward H. Egan.....	May 17, 1902..	150 00
Black Lands Gully.....	Urbain Daigle.....	" 28, 1903..	130 00
Cape Enrage Fog Alarm and Light.....	James G. Barbour. ....	" 11, 1888..	800 00
Cape Jourimain.....	A. J. P. Bent.....	Jan. 26, 1901..	360 00
Cape Tormentine .....	J. R. Barry. ....	Mar. 26, 1906..	150 00
Caraguet .....	G. Laintaigne .....	June 16, 1888..	240 00
" Lower Light.....	Frederic F. Doucet, jr. . .	Oct. 14, 1903..	75 00
" " " .....	Patrice L. Legere.....	" 14, 1903..	75 00
Coxs Point .....	Alexander McBain.....	May 26, 1898..	100 00
Cassies Point .....	Placide Legere.....	June 2, 1909..	*240 00
Cape Spencer Fog Alarm.....	John E. Collins.....	Nov. 22, 1909..	1,000 00
Cherry Island .....	Harry Chaffey .....	Oct. 14, 1903..	180 00
Cocagne Range .....	Dominique Gognen.....	" 14, 1907..	200 00
Church Point (Buctouche).....	D. O. Maillett.....	July 7, 1883..	180 00
Dalhousie Harbour.....	James Arseneau.....	June 18, 1894..	130 00
Dipper Harbour.....	Fenwick Belmore.....	Mar. 12, 1895..	155 00
Douglas Island and P.W. Montgomerys Isld.	Henry McNeil.....	Jan. 1, 1880..	300 00
East Hd. Musquash.....	Chas. P. Hamm .....	" 14, 1879..	385 00
Escuminac Alarm and Light.....	Kenneth R. McLennan.....	Mar. 7, 1892..	920 00

\* \$25 for foghorn.



SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—*Continued.*

NEW BRUNSWICK—*Continued.*

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Fox Island Upper, Light.....	Seymour Williston.....	June 4, 1902..	300 00
" Lower ".....	George Mills.....	" 23, 1897..	240 00
Fanjoys Point.....	William Fanjoy.....	Dec. 15, 1897..	100 00
Flewelling's Wharf.....	Mary Flewelling.....	April 12, 1890..	100 00
Fort Monckton.....	W. A. Casey.....	Jan. 1, 1909..	85 00
Fort Folly.....	Amos P. Belliveau.....	June 23, 1903..	265 00
Gagetown.....	Fraser Fox.....	April 22, 1904..	100 00
Grindstone Island Alarm ..	James R. Russell.....	Jan. 13, 1899..	800 00
Gannet Rock Alarm.....	Coleman Dalzell.....	July 1, 1904..	1,150 00
Green Head.....	Thos. E. Looney.....	" 14, 1886..	200 00
Grant Beach.....	W. A. Davidson.....	April 3, 1909..	120 00
Gull Cove.....	Lewis Frankland.....	Nov. 14, 1902..	100 00
Goose Lake.....	John D. Brune.....	May 11, 1888..	300 00
Grand Harbour.....	Lloyd C. Dakin.....	" 2, 1904..	485 00
Grand Manan, Fog Alarm.....	George T. Tatton.....	Oct. 16, 1866..	800 00
Grays Landing.....	B. F. McCutcheon.....	Mar. 6, 1907..	80 00
Head Harbour Light and Fog Alarm.....	Chas. D. Hyliard.....	June 29, 1904..	865 00
Heron Island.....	John A. D. Robertson.....	April 1, 1902..	240 00
Hendrys Point, Washademoak Light.....	Miss A. M. Hendry.....	Mar. 15, 1899..	100 00
Hay Island.....	Joseph Allain.....	May 21, 1895..	180 00
Harpers Point.....	Lawrence Blakley.....	Sept. 9, 1887..	95 00
Hampstead.....	Edgar B. Palmer.....	Nov. 6, 1900..	100 00
Jemseg.....	Geo. F. Nevers.....	Nov. 24, 1884..	100 00
Kouchibouguac.....	Henry Gagnon.....	June 26, 1908..	180 00
Letete Fog Alarm and Light.....	Sydney Dines.....	Mar. 27, 1907..	640 00
Light Ship (Miramichi).....	Capt. Robt. McLean.....	April 12, 1902..	800 00
Little Belledune (Miscou Gully).....	J. A. Roberty.....	Feb. 21, 1905..	300 00
Little Shippegan.....	Robt. McConnell, jr.....	Sept. 9, 1887..	130 00
Long Point Bellisle Light.....	James A. Bates.....	June 1, 1907..	100 00
Machias Seal Island Light and Fog Alarm.....	W. L. Harvey.....	July 8, 1904..	1,200 00
McFarlane Point.....	Alex. McFarlane.....	Dec. 9, 1909..	60 00
Midgie Bluff Light.....	Arthur Henderson.....	Oct. 4, 1894..	200 00
Miscou.....	Joseph L. Robichaud.....	Nov. 11, 1902..	800 00
Musquash.....	R. P. McDonald.....	Jan. 28, 1901..	130 00
Middle Island.....	Michael Murray.....	April 10, 1902..	240 00
Mark Point.....	Wm. Maloney.....	Nov. 7, 1903..	150 00
McMann Point.....	Harvey R. McMann.....	Jan. 2, 1901..	100 00
McFarlane Point.....	Alex. McFarlane.....	Dec. 3, 1909..	60 00
Mulholland Point.....	Alvin Parker.....	June 13, 1901..	200 00
Neguac.....	John Robinson.....	" 30, 1895..	240 00
Neguac Range.....	Chas. McIntosh.....	Dec. 10, 1892..	130 00
Negro Head Submarine Bell.....	Alfred Splane.....	Oct. 26, 1905..	250 00
Negrotown Point.....	E. Ross.....	Mar. 5, 1878..	460 00
Newcastle.....	Blackstock Matheson.....	April 18, 1898..	100 00
Oak Point, St. John River Light.....	Mrs. Bessie May Francombe.....	Dec. 20, 1907..	95 00
Oromocto Shoals Light.....	Sadie Brennan.....	Jan. 1, 1910..	100 00
Oak Point (Miramichi) Light.....	John Bowie.....	June 2, 1906..	130 00
Partridge Island Light and Fog Alarm.....	Hugh Andrews.....	May 1, 1906..	1,200 00
Pokemouche Light.....	Michael Hayden.....	Oct. 17, 1888..	300 00
Portage Island Light.....	Peter Morrison, Jr.....	May 17, 1892..	325 00
Pt. Lepreaux.....	Robert L. Belding.....	June 30, 1905..	450 00
Pt. Lepreaux Fog Alarm.....	Frank Frauley.....	" 30, 1905..	900 00
Pea Point Light.....	Elias C. Dickson.....	Nov. 16, 1898..	325 00
Passamaquoddy Bay Light, West.....	Joseph Kilpatrick.....	Feb. 3, 1898..	485 00
" " East.....	Theobald Rooney.....	Jan. 1, 1896..	425 00
Preston Beach.....	Stanislaus Preston.....	July 11, 1889..	150 00
Petit Rocher.....	J. B. Boudreau.....	Feb. 26, 1896..	180 00
Peck Point L. and F. A.....	Edwin Lockhart.....	Oct. 20, 1903..	510 00
Poquesuide Light.....	Octave Hachey.....	July 12, 1881..	265 00
Palmer Point.....	Robert E. Pickett.....	May 11, 1897..	100 00
Pointe Brulee.....	Frank Gould.....	Jan. 13, 1899..	85 00
Pointe du Chene.....	Thomas Harts.....	Feb. 17, 1905..	100 00
Perry Point.....	John Carney.....	Sept. 25, 1900..	100 00



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

NEW BRUNSWICK—Concluded.

Name of Station.	Name of Keeper.	Appointed.	Salary
			\$ cts.
Quaco. ....	Charles Brown. ....	Nov. 25, 1884 .	400 00
" Breakwater. ....	Fred M. Cochran. ....	Mar. 25, 1892..	155 00
" Fog Alarm. ....	L. B. Bradshaw. ....	Aug. 2, 1887..	400 00
Robertson Point . . . . .	Chas. W. Robertson. ....	June 30, 1897..	100 00
Richibucto. . . . .	Peter F. Richard . . . . .	May 30, 1895..	210 00
" Beacon. . . . .	Jude Robichaud. ....	June 16, 1902..	200 00
" Bar. . . . .	Joseph F. Richard . . . . .	June 16, 1902..	180 00
** " N., Beach. ....	Fredk. McNeil . . . . .	May 3, 1909..	120 00
Reids Point . . . . .	Whitney Lamb. ....	April 1, 1909..	80 00
Railway Wharf, Moffat Landing. ....	Geo. Cumming. ....	Jan. 1, 1880..	130 00
Sapin Point. ....	Victor Daigle. ....	May 28, 1903..	65 00
South Tracadie. ....	Wm. C. Ferguson. ....	Mar. 23, 1898..	180 00
Swallow Tail . . . . .	Geo Y. Dalzell. . . . .	Mar. 18, 1893..	485 00
St. Andrews . . . . .	W. J. Pendlebury. ....	April 10, 1889..	320 00
St. Louis Gully. ....	Honore H. Chaisson. ....	July 16, 1909..	100 00
St. John Harbour, L. & F. Bell. ....	Andrew Shepherd. ....	Dec. 9, 1909..	405 00
Spruce Point. ....	Bertie G. Hannah. ....	Sept. 15, 1892..	150 00
Sand Point . . . . .	Richard Wagner. ....	June 7, 1883..	100 00
Shediac. ....	M. Robinson . . . . .	Dec. 29, 1873..	300 00
Southern Wolf . . . . .	Ethelbert Wright. ....	Mar. 6, 1906..	555 00
Shippigan. ....	Adelard Savoie. ....	April 2, 1906..	350 00
Shippigan Gully Range Lights . . . . .	John de Grace . . . . .	June 4, 1889..	180 00
Sheldrake Island. ....	John A. Morrison. ....	Jan. 3, 1910..	240 00
Scuth West Head. ....	Clyde S. Ingersoll. ....	July 10, 1907..	555 00
Stonehaven . . . . .	Mrs. Elizabeth Scott. ....	July 8, 1904..	130 00
The Cedars. ....	Forrest Williams. ....	May 11, 1897..	100 00
Tracadie . . . . .	Fabien D. Basque. ....	Aug. 20, 1904..	300 00
Tiners Point Fog Alarm . . . . .	Alfred Splane . . . . .	Aug. 21, 1905..	800 00
Wilmots Bluff . . . . .	J. H. True . . . . .	Sept. 12, 1899..	100 00
Wards Point . . . . .	Edward Lockhart . . . . .		†510 00

† \$250 for submarine Station.

QUEBEC AGENCY.

Algernon Rock and Stone Pillars. ....	George Leclerc. ....	July 30, 1901..	700 00
Amherst Island. ....	William Cormier. ....	Apr. 26, 1871..	400 00
Anse à l'Eau. ....	Auguste Gingras . . . . .	" 1, 1909..	65 00
Anse St. Jean. ....	F. Lavoie . . . . .	Mar. 13, 1889..	65 00
Anticosti S. W. Pt. . . . .	Z. Lemieux. ....	July 10, 1900..	700 00
" W. Pt. . . . .	Alfred Malouin . . . . .	" 1, 1877..	875 00
Bagot Bluff Anticosti. ....	Emile Leprise. ....	Apr. 18, 1903..	960 00
Barachois de Malbaie. ....	X. Lemieux . . . . .	Mar. 6, 1903*..	80 00
Bellechasse . . . . .	Joseph Bilodeau . . . . .	June 15, 1903..	400 00
Belle isle, S.W. End. . . . .	Jean L. Thibodeau. ....	Oct. 25, 1907..	1,600 00
" N.E. End. ....	Paul Thomas . . . . .	July 8, 1904..	1,350 00
Bersimis "R" . . . . .	Henri Granier . . . . .	Aug. 8, 1903..	130 00
Bicquette . . . . .	Louis Pinault. ....	Oct. 6, 1900..	800 00
Bird Rocks . . . . .	Wilfred Bourque. ....	Nov. 15, 1905..	1,350 00
Brandy Pots. ....	Alphonse Richard. ....	Oct. 7, 1878..	460 00
Brion Island. ....	Procule Chevrier. ....	June 23, 1905..	460 00
Bonaventure River Wharf. ....	Alexis Bourque. ....	Feb. 25, 1909..	50 00
Cap à l'Aigle. ....	Electric Lt. ....		
Cap Anguille . . . . .	Alfred Patry. ....	Oct. 9, 1908..	1,200 00
Cap au Corbeau. ....	Edouard Codé . . . . .	" 26, 1905..	80 00
Cap aux Oies. ....	Capt. Thos. Tremblay. ....	May 1, 1888*..	300 00
Cape Bauld. ....	Edmond Fontaine. ....	Sept. 1, 1905..	1,000 00
Cap Chatte . . . . .	Luc Côté. ....	July 26, 1901..	700 00
Cap Chatte Rouge. ....	Urbain Chretien. ....	" 7, 1909..	80 00



SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—*Continued.*

QUEBEC AGENCY—*Continued.*

Name of Station.	Name of Keepers.	Appointed.	Salary
			\$ cts.
Cape Dogs.....	Ludger Bergeron.....	Sept. 11, 1909..	680 00
" Despair.....	Charles Bourget.....	Nov. 1, 1897*..	460 00
" Gaspé.....	Frs. Le Huquet.....	Oct. 22, 1896..	700 00
" Madeleine "B".....	J. F. Sasseville.....	June 9, 1886...	800 00
" Norman.....	J. W. Campbell.....	Apr. 12, 1890...	920 00
" Ray.....	E. H. Rennie.....	Oct. 19, 1884...	1,000 00
" Rosier.....	Eug. Costin.....	Nov. 4, 1890...	960 00
" Salmon.....	Louis Bouchard.....	May 16, 1896...	800 00
Carleton Wharf.....	Francis Cullin.....	July 12, 1907...	75 00
" Point.....	Louis Bujold.....	May 25, 1899*..	360 00
<i>Chicoutimi Lights.</i>			
Chicoutimi Wharf.....	André Harvey.....	May 30, 1889...	65 00
Post St. Martin "B".....	Frs. Gauthier.....	Apr. 22, 1907...	75 00
" "F".....	Alfred Pilote.....	" 22, 1907...	75 00
Riv. du Moulin "B".....	Luce Gourdeau.....	May 1, 1905...	75 00
" "F".....	George Tremblay.....	" 1, 1905...	75 00
Riv. Caribou "B".....	H. Simard.....	Mar. 1, 1905...	75 00
" "F".....	John Savard.....	" 1, 1905...	75 00
Riv. Valin "R".....	Gédéon Lavoie.....	June 7, 1909...	60 00
" "F".....	Maximin Lavoie.....	Summer, 1893...	60 00
Savard Valin "R".....	Dorilas Savard.....	July 18, 1904...	130 00
Chlorydorme "R".....	Magloire Coulombe.....	Oct. 15, 1904...	130 00
Crane Island.....	Désiré Vézina.....	Apr. 25, 1904...	360 00
Domaine "B".....	Xavier Emond.....	May 30, 1908...	80 00
" "F".....	Edouard Guerard.....	" 30, 1908...	80 00
Duthies Pt.....	B. V. Willett.....	Oct. 16, 1903...	95 00
Eboulements.....	Wilfred Bouchard.....	Apr. 25, 1906...	65 00
Egg Island.....	Tancrede Pelletier.....	July 1, 1901...	530 00
Entry Island.....	George F. Cullins.....	" 30, 1901...	300 00
Étang du Nord.....	N. Arsenault.....	" 21, 1891*..	400 00
Escoumains "R".....	Saguenay Lumber Co.....	Sept. 10, 1906...	150 00
Fame Point.....	James Ascah.....	" 2, 1880...	1,200 00
Father Point.....	J. McWilliams.....	May 20, 1893...	1,200 00
Flower Island.....	Joseph Lavallée.....	Apr. 12, 1905...	700 00
Fox River "R".....	André Samuel.....	Oct. 15, 1904...	130 00
Gascons, Wharf.....	John Mourant.....	June 8, 1906...	75 00
Gaspé Basin.....	William Lindsay.....	" 14, 1900...	65 00
Godbout.....	N. A. Comeau.....	Mar. 31, 1910...	80 00
Grande Entrée.....	André Turbide.....	Apr. 6, 1907...	75 00
Grande Isle Kamouraska.....	Arthur Levesque.....	Feb. 9, 1901...	460 00
Grande-Rivière.....	William Bisson.....	Oct. 22, 1896...	*150 00
Grand Rivière, Wharf.....	J. B. Couture.....	May .. 1903...	65 00
Grande Vallée, Range.....	A. Fournier.....	Oct. 15, 1904...	130 00
Green Island.....	R. W. Lindsay.....	Sept. 28, 1888...	700 00
Greenly Island.....	Napoleon Côté.....	Oct. 12, 1903...	1,200 00
Griffons, Cove "R".....	H. Boulet.....	June 29, 1908...	130 00
Grosse Roche.....	Nazaire Morin.....	" 25, 1906...	500 00
Heath Point.....	Christopher Huber.....	July 27, 1907...	800 00
Hospital Rock.....	Victor Lavoie.....	Apr. 1, 1909...	240 00
Ile au Béliet.....	Wm. Gaudreault.....	Oct. 30, 1901...	150 00
Ile aux Coudres.....	Eusebe Boudreault.....	Apr. 20, 1906...	65 00
Ile Bonaventure.....	J. B. Bujold.....	May 5, 1909...	50 00
Little Métis.....	Elisée Caron.....	" 29, 1909...	380 00
Magpie "R".....	Albert Dupuis.....	Sept. 14, 1907...	130 00
Maquereau Point.....	A. Bertrand.....	Dec. 21, 1877...	*360 00
Matane.....	Joseph Banville.....	Feb. 1, 1897...	385 00
Monte du Lac "R".....	W. Labranche.....	May 2, 1905...	460 00
Mont Louis "R".....	Louis Létourneau.....	" 22, 1906...	130 00
St. Thomas de Montmagny.....	Capt. H. Boulanger.....	Apr. 13, 1878...	100 00
Murray Bay.....	Electric Light.....	Dec. 31, 1907...	.....
Natashquan.....	Elie Landry.....	July 28, 1906...	250 00
New Carlisle, Wharf.....	John Chisholm.....	Jan. —, 1909...	55 00

\* With \$25 for blowing foghorn.



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

QUEBEC AGENCY—Concluded.

Name of Stations.	Name of Keepers.	Appointed.	Salary.
			\$ cts.
Newport.....	Salomon Grenier.....	June 3, 1897..	*150 00
New Richmond, Wharf.....	William Campbell.....	Feb. 17, 1 10..	50 00
Oak Point, Restigouche "R".....	Thomas Harper, Jr.....	Jan. 1, 1907..	100 00
Orlean Range—			
Ange-Gardien "B".....	Olivier Paré.....	Nov. 16, 1902..	80 00
"    "F".....	Jean Gagné.....	Sept. 28, 1909..	60 00
Sainte-Famille "B".....	Alphonse Pâquet.....	Oct. 19, 1885..	75 00
"    "F".....	Alfred Poulin.....	" 26, 1896..	85 00
Saint-Pierre "B".....	Jacques Roberge.....	May 16, 1908..	80 00
"    "F".....	Olivier Vézina.....	Oct. 28, 1897..	80 00
Paspébiac.....	John Loisel.....	Aug. 27, 1899..	*180 00
Percé, Laurier Wharf.....	Florian Bourget.....	Mar. 18, 1893..	*180 00
".....	Emice Bourget.....		50 00
Perroquet Island.....	Placide Vigneau.....	Sept. 19, 1892..	675 00
Pilgrims.....	H. Morin.....	Apr. 29, 1898..	400 00
Plateau.....	John Thomas St. Croix.....	Sept. 11, 1909..	*380 00
Point Amour.....	Thomas Wyatt.....	Oct. 18, 1889..	1,200 00
Point à Basile "B".....	Antonio Demers.....	July 22, 1904..	150 00
"    "F".....	Elzéar Douville.....	Feb. 6, 1904..	150 00
Point à la Garde Light Ship.....	Chas Brown.....	June 26, 1904..	385 00
" aux Esquimaux "R".....	J. F. Boudreault.....	Oct. 29, 1907..	130 00
" aux Orignaux.....	Dominique Levesque... ..	Oct. 5, 1903..	360 00
" Bleue.....	Armand Tessier.....	June 9, 1904..	65 00
" des Monts.....	Victor Fafard.....	Aug. 1, 1899..	700 00
" Echouerie or Bonaventine Pt.....	Pitre Bourdage.....	July 25, 1903..	225 00
" Noire "R".....	J. E. Boulianne.....	Jan. 18, 1904..	240 00
" Riche.....	N. Breton.....	May 16, 1896..	530 00
Port Daniel.....	F. X. Langlois.....	Feb. 22, 1907..	*80 00
" West.....	Arthur Horrie.....	Jan. 1, 1907..	130 00
Portneuf-en bas "R".....	Pierre Poitras.....	Oct. 16, 1904..	130 00
"    ".....	Edmond Tremblay.....	May 7, 1903..	360 00
Quebec Harbour.....	Quebec Harbour Commission.....		60 00
Red Islet.....	P. T. Fraser.....	April 28, 1894..	540 00
Rimouski Wharf.....	Gbalde Lavoie.....	May 22, 1906..	65 00
Rivière à la Martin.....	August Leclerc.....	Sept. 3, 1902..	960 00
"    " Pipe.....	Alex. Morin.....	Oct. 3, 1901..	80 00
Rivière du Loup.....	F. E. Gilbert.....	July 2, 1897..	80 00
Roberval.....	Roberval Electric Light Co.....	June 28, 1898..	100 00
Sand Beach Point.....	Thomas Kennedy.....	Aug. 9, 1904..	†460 00
Ste Anne "B".....	Alphonse Poulin.....	Oct. 26, 1898..	80 00
"    "F".....	Cezare Dufour.....	1909..	80 00
St. Alphonse.....	Pitre Tremblay.....	June 19, 1895..	65 00
St. Antoine.....	Leonidas Frechette.....	Mar. 4, 1902..	100 00
".....	Francois Doré.....	April 14, 1903..	130 00
St. Charles de Caplan.....	Frank Dion.....	May 10, 1909..	50 00
St. Godfroy Wharf.....	Jacques Grenier.....	May 3, 1909..	50 00
Ste Anne des Monts "R".....	N. Lafrancois.....	Oct. 15, 1904..	130 00
Ste Croix.....	Willie A. Thurber.....	Mar. 18, 1901..	180 00
"    "R" "F".....	Widow D. Racette.....	Dec. 1900..	80 00
"    "B".....	D. Croteau.....	Mar. 28, 1901..	80 00
St. François, "B".....	Louis Marceau.....	April 1, 1884..	95 00
"    "F".....	Jos. Lepage, Jr.....	April 20, 1876..	80 00
St. Iréné.....	Electric Light.....		
St. Jean, I. O.....	Theophile Pouliot.....	June 21, 1909..	240 00
Ste Félicité F. A.....	Francois Belanger.....	Jan. 14, 1905..	640 00
St. Pancras Pt.....	Pamphile Gravel.....	April 21, 1910..	240 00
St. Siméon Wharf.....	Henry Savard.....	Oct. 25, 1906..	65 00
St. Laurent I. O.....	Joachim Godbout.....	April 15, 1904..	300 00
St. Petronille.....	Nap. Ferland.....	Sept. 3, 1904..	250 00
Seven Islands.....	Horace Desmeules.....	May 20, 1898..	800 00
Trois Pistoles Wharf.....	Cyrice LeBel.....	Oct. 25, 1907..	125 00
Upper Traverse Pier.....	Alfred Fournier.....	April 14, 1900..	800 00

\* \$25.00 for blowing foghorn.



SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—*Continued.*

MONTREAL AGENCY-

Name of Station.	Name of Keeper.	Appointed.	Salary.
			\$ cts.
Argenteuil Baie.	Pierre Giroux.		80 00
Ash and Bloody Islands, "R"	Jas. A. McGee.	May 26, 1903.	240 00
Barre à Boulard, "F"	Nap Daigle.	" 26, 1901.	240 00
" " "B"	Philias Abel.	June 23, 1903.	95 00
Batiscan, "F"	Arcade La Haie.	May 26, 1909.	120 00
" " "B"	Joseph L. Brunell.	Apr. 27, 1905.	100 00
Becancour, "F"	Omar Gingras.	Oct. 24, 1905.	180 00
" " "B"	A. Tourigny.	" 24, 1905.	130 00
Beauharnois.	Alphonse Daoust.	Apr. 14, 1903.	260 00
Bellerive Park.	Chas. Roy.	Aug. 5, 1904.	200 00
Boucherville.	Hiliodore Carrière.	" 26, 1903.	100 00
Cap Charles, "B"	Amédé Baron.	June 26, 1901.	100 00
" " "F"	Alcide Boisvert.	" 26, 1901.	100 00
Cap Madeline, "F"	Moise Hébert.	May 11, 1888.	100 00
" " "B"	G. Vaillancourt.	Oct. 1, 1906.	130 00
" " U.R. "F"	Pierre Toupin.	Apr. 26, 1905.	100 00
" " "B"	Elzéar Beaumier.	Oct. 1, 1905.	130 00
" " Village, "R"	Ernest Lacourse.	Mar. 13, 1906.	200 00
Caron Point.	Honoré Sauvé.	May 1, 1889.	80 00
Champlain, "B"	Louis Bertrand.	Sept. 12, 1902.	130 00
" " "F"	Philippe L. Carignan.	Oct. 1, 1902.	100 00
Chambly Basin, "R"	Jos. de Senneville.	May 26, 1907.	150 00
" Canton, "R"	Joseph Savage.	" 10, 1907.	150 00
Contrecoeur Course, "B"	Norbet Duval.	Apr. 22, 1904.	130 00
" " "F"	Jos. Arpin.	Sept. 12, 1902.	100 00
Contrecoeur Trav., "B"	Alfred Lacroix.	July 26, 1904.	130 00
" " "F"	Joseph Alcidas Lacroix.	Apr. 14, 1904.	100 00
" Verchères "B"	Ernest Guyon.	Nov. 11, 1904.	150 00
" " "F"	Honoré Tetrault.	" 11, 1904.	150 00
Dorval and Pte. Claire.	Benj. Gloude.	Aug. 1, 1907.	400 00
Gallia Bay, U.R.	Elzéar Cantara.	May 3, 1904.	350 00
" L.R.	Louis Piloquin.	June 8, 1906.	350 00
Guard Pier.	Benj. Rodier.	Sept. 10, 1907.	500 00
Gentilly, "B"	Delphis Mailhot.	Apr. 2, 1907.	150 00
" " "F"	Alphonse Lebleue.	" 6, 1907.	250 00
Graham, Ont., "F"	Wm. Graham.	Dec. 19, 1904.	75 00
" " "B"	Xavier Sicard.	Apr. 29, 1905.	75 00
Green Shoal.	Albert Laberge.	May 20, 1902.	200 00
Grondines, "B"	Jos. Sauvageau.	June 20, 1904.	130 00
" " "F"	Eugène Mayrand.	" 20, 1904.	180 00
" Pte., "B"	Emile Houde.	" 20, 1904.	130 00
" " "F"	Achile Sauvageau.	" 20, 1904.	300 00
Hochelaga, "R"	Alphonse Chartier.	Aug. 5, 1904.	200 00
Ile à la Bague.	Louis Dupois.	Apr. 14, 1903.	180 00
Ile à l'Aigle, "B"	Ens. Savarie.	May 1, 1903.	130 00
" " "F"	F. X. Lapointe.	" 1, 1903.	130 00
Ile de Pads, "R"	Zotique Courschene.	Aug. 8, 1907.	300 00
Ile des Barques.	Omer Salvail.	May 6, 1897.	300 00
Ile de Grâce, "B"	Louis Letendre.	" 1, 1906.	130 00
" " "F"	Edmond Paul.	Sept. 7, 1871.	240 00
" du Maine, "B"	Paul Menzeau.	Dec. 27, 1906.	150 00
" " "F"	Etienne Provençal.	Dec. 27, 1906.	130 00
" au Raisin, "R"	Louis Boucher.	Apr. 13, 1898.	300 00
" Bouchard, "B"	Alphonse Chicoine, jr.	June 16, 1903.	100 00
" " "F"	Ivon Laporte.	Apr. 21, 1902.	150 00
" Deslauriers, "F"	Nap Langevin.	Dec. 18, 1906.	150 00
" " "B"	Ph. Choquet.	Mar. 13, 1908.	100 00
" Ronde.	Herman Charland.	Aug. 1, 1907.	500 00
" Perrot.	Andrew McNab.	May 20, 1905.	130 00
" Ste. Thérèse, U.R.	Sam Reeves.	Oct. 12, 1870.	300 00
" " L.R.	Joseph Malo.	Feb. 1, 1897.	130 00
Jones Island.	Joseph Charlebois.	Apr. 22, 1909.	80 00
Lacolle.	W. G. Whitman.	Jan. 18, 1904.	150 00
L'Anglais Pte.	Antoine Langlois.	July 11, 1888.	150 00



STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

MONTREAL AGENCY—Continued.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Lake Memphremagog:—			
Black Pointe.....	J. H. Peters.....	June 1, 1881..	65 00
Lead Mines.....	W. Wheeler... ..	June 1, 1881..	65 00
Molson Island.....	Miss E. G. Molson..	May .., 1878..	85 00
Georgeville.....	C. E. Martel.....	May 19, 1891..	65 00
Wadleigh Point.....	J. A. Patterson... ..	June 1, 1891..	65 00
Witch Rock.....	D. E. Peters.....	" 1, 1891..	150 00
Lachine and Range .....	Thomas Léger.....	Jan. 5, 1905..	500 00
Longue Pointe and Trav. Range.....	James Fletcher..	May 16, 1904..	150 00
L'Orignal Ont. ....	Grégoire Séguin.....	" 8, 1894..	130 00
Louisville "R" .....	Onésime Plante.....	June 23, 1907..	150 00
Lake St. Peter "R" .....	Désiré Lafèche.....	April 12, 1887..	530 00
" " "R" .....	Hector Fiset ....	" 22, 1875..	530 00
Lavaltrie "R" .....	Eloi Lacombe.....	June 2, 1909..	240 00
Light Ship No. 3 (L. St. Peter).....	J. B. Weaner.....	May 9, 1904..	510 00
L'Islet Richelieu.....	Jos. Auger .....	Jan. 20, 1905..	150 00
Lotbinière "B" .....	George-Beaudet.....	" 4, 1883..	100 00
" "F" .....	Mrs. L. Beaudet.....	Sept. 3, 1903..	100 00
McTavish Pt. ....	J. Campbell .....	Nov. 18 1896..	130 00
Nicolet River "B" .....	Edmond Heroux.....	Dec. 5, 1906..	130 00
" " "F" .....	Didier Heroux.....	" 5, 1906..	225 00
North ½ Way Pt. "R" .....	Joseph Lord.....	May 5, 1903..	180 00
Oka .....	Mrs. H. Lacroix.....	Nov. 10, 1898..	150 00
Papineauville.....	Joseph Chabot... ..	June 17, 1897..	125 00
Petite Trav. Contrecoeur "B" .....	Joseph St. Laurent.....	April 1, 1909..	100 00
" " "B" .....	Louis Caisse .....	" 22, 1904..	100 00
Platon Range .....	Chas Beaudet.....	Aug. 24, 1894..	150 00
Pointe à Cadieux.....	Simon Poirier.....	May 4, 1904..	180 00
Pointe aux Anglais.....	Lucas H. Masson..	July 10, 1907..	240 00
Pointe aux Citrouilles.....	Wm. Brunnelle.....	May 26, 1908..	180 00
Pointe du Lac .....	Sylva Paquin.....	" 2, 1900..	130 00
Portneuf Range.....	Josephine Rodrique.....	Dec. —, 1900..	300 00
Port St. Francis .....	Frs. Manseau.....		300 00
Repentigny "B" .....	L. L. Rivet.....	April 28, 1894..	95 00
" "F" .....	J. B. Lachapelle .....	Feb. 1, 1861..	95 00
Rigaud.....	Cap. A. Malette.....	Oct. 27, 1907..	150 00
River St. Francois.....	Philias Desmarais .....	July 2, 1897..	150 00
St. Anne de Sorel "F" .....	Pierre Cournoyer.....	Mar. 28, 1906..	130 00
" " "B" .....	Frs. Lanciault.....	" 28, 1906..	100 00
St. Anne de Bellevue.....	J. L. Stoker.....	May 20, 1902..	150 00
St. Anne Lock.....	F. H. Demers .....	" 17, 1907..	90 00
St. Emélie "B" .....	Emery Filteau.....	Mar. 16, 1905..	100 00
St. Emélie "F" .....	A. Laliberté.....	Sept 24, 1888..	100 00
St. Jean Per .....	Ernest Menard .....	April 1, 1909..	160 00
St. Ours Trav. "F" .....	J. B. Laporte.....	" 26, 1904..	150 00
" " "B" .....	Anathase Gaudette .....	Oct. —, 1908..	110 00
St. Pierre les Becquets.....	M. O. Tousignant .....	May 26, 1901..	80 00
St. Placide.....	Philibert Lefebvre.....	Oct. 1, 1909..	150 00
St. Valentine Range.....	Alfred Martin.....	June 30, 1909..	120 00
Sorel Harbour.....	R. & O. Nav. Co.....	Sept. 6, 1854..	85 00
Three Rivers .....	J. W. Luckerhoff.....	" 9, 1908..	.....
Upper Champlain "B" .....	Louis Pothier.....	April 1, 1906 ..	136 00
" " "F" .....	Jos Massicotte.....	" 1, 1906..	100 00
Varennas .....	Azarie Geoffrion.....	May —, 1903 ..	80 00
Varchères Trav. "B" .....	Philias Charbonneau .....	April 31, 1902 ..	80 00
" " "F" .....	F. X. Chicoine.....	" 21, 1902..	100 00
" Village "B" .....	Felix Bousquet.....	" 21, 1902..	80 00
" " "F" .....	J. s. Guyon.....	" 21, 1903..	100 00
Way Channel.....	Moise Beauchamp.....	Nov. 20, 1906..	130 00



SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—*Continued.*

ONTARIO DIVISION.

Name of Station.	Name of Keeper.	Appointed.	Salary.	
			\$	cts.
Allumette Island.....	John Cox, Jr.....	June 22, 1887..	130	00
" Lake.....	John T. Manders.....	Aug. 7, 1907..	130	00
Arnprior Island.....	William Kilroy.....	Oct. 1, 1905..	180	00
Aylmer Island.....	Francis Boucher.....	May 3, 1907..	180	00
Bamford Island.....	Robert Bamford.....	June 21, 1888..	325	00
Barriefield Common 'R'.....	William Murray.....	May 17, 1900..	180	00
Baskin Wharf.....	Silas Sullivan.....	Dec. 22, 1896..	150	00
Battle Island.....	C. S. McKay.....	Aug. 27, 1877..	555	00
Belleville.....	J. C. Weir.....	Apr. 4, 1901..	240	00
Bishops Bay.....	John S. Sutherland.....	Sept. 3, 1909..	150	00
Blind River Range.....	W. H. McGauley.....	Apr. 28, 1908..	60	00
Bois Blanc.....	Agnes Hackett.....	June 22, 1901..	460	00
Boyd Island.....	Mrs. Elizabeth Martin.....	Jan. 6, 1905..	300	00
Brebeuf.....	William J. Baxter.....	May 23, 1885..	400	00
Brighton.....	H. V. Simpson.....	" " 1888..	540	00
Bronte.....	Chas. Osborne.....	Oct. 20, 1906..	250	00
Bruce Mines.....	Wm. Fleming.....	Mar. 31, 1909..	50	00
Buckoins Point.....	Godfrey Onellet.....	Feb. 23, 1884..	200	00
Burlington Beach.....	Thomas Lundy.....	May 2, 1905..	485	00
Byng Inlet.....	Louis Lamondin.....	July 20, 1901..	425	00
Cabot Head.....	Charles Webster.....	May 10, 1898..	920	00
Campbell Island.....	Robert Wilson.....	Jan. 8, 1905..	180	00
Cape Robert.....	N. Matheson.....	Nov. 13, 1902..	360	00
Cape Croker.....	R. Chapman.....	Oct. 2, 1896..	1,050	00
Caribou Island.....	Antoine Boucher.....	May 3, 1907..	1,200	00
Cecebe Lake.....	John Schade.....	Aug. 29, 1906..	250	00
Centre Brother Island.....	D. Wemp.....	Jan. 9, 1901..	240	00
Chantry Island.....	Malcolm McIver.....	Apr. 1, 1907..	530	00
Chenal Ecarté.....	Peter Willis.....	Dec. 3, 1908..	100	00
Cherry Island.....	I. S. Johnson.....	Nov. 5, 1883..	300	00
Christian Island.....	Allan Collins.....	Mar. 25, 1881..	485	00
Clapperton Island.....	Henry F. Baker.....	Dec. 2, 1895..	385	00
Cobourg.....	Robert Gorden.....	May 16, 1883..	240	00
Colchester Reef.....	John Manson.....	" 1, 1888..	850	00
Coal Shoal.....	R. P. Boyd.....	Apr. 9, 1884..	300	00
Collingwood.....	Jas. W. Lunan.....	Jan. 2, 1904..	425	00
Coppermine Point.....	Frank E. Roussain.....	Apr. 1, 1909..	140	00
Corbay Point.....	Joseph Davieau.....	May 27, 1890..	385	00
Corunna.....	W. J. Scott.....	Apr. 23, 1901..	150	00
Côteau Landing.....	Thos. Filiatreault.....	May 27, 1890..	150	00
Coulouge Lake.....	Evang. Bertrand.....	Apr. 2, 1892..	130	00
Cove Island.....	Kenneth McLeod.....	June 19, 1903..	920	00
Darlington.....	Port Darling Har. Co.....	..... 1886..	100	00
Deep River Island.....	Jos. Beauchamp.....	..... 1908..	130	00
Deseronto.....	Rathbun Lumber Co.....	Oct. 14, 1884..	200	00
Eddy Wharf Range.....	Eddy Bros.....	" 1, 1905..	60	00
False Ducks.....	Darland Dulmage.....	May 19, 1903..	800	00
Ferris Island.....	J. Morriseau.....	Mar. 24, 1898..	240	00
Flowerpot Island.....	D. Smith.....	Oct. 6, 1909..	450	00
Fort-William, Upper Ottawa.....	Jas. McCool, Sr.....	May 23, 1887..	90	00
Fox Island.....	John Prosser.....	Sept. 14, 1896..	250	00
Frenchmans Bay.....	Wm. O'Brien.....	Apr. 14, 1904..	150	00
French River.....	Mrs. E. B. Borron.....	Jan. 20, 1903..	555	00
Gananoque Narrows and Jackstraw Shoal.....	Mrs. Manly Cross.....	Jan. 2, 1908..	550	00
Gargantua.....	Louis Miron.....	Oct. 26, 1899..	485	00
Giants Tomb.....	A. H. Griffith.....	Sept. 17, 1898..	300	00
Gibraltar Point.....	P. J. McSherry.....	May 2, 1905..	400	00
Gimli.....	E. G. Thompson.....	Jan. 21, 1910..	50	00
Goderich.....	Robert Campbell.....	June 9, 1886..	460	00
" Beacon.....	".....	" 9, 1886..	50	00
Gore Bay.....	Angus Matheson.....	July 10, 1903..	385	00
Gravenhurst Narrows.....	Isaac Barnes.....	Mar. 20, 1906..	130	00







SESSIONAL PAPER No. 21

STATEMENT giving Names of Stations and Lightkeepers, &c.—*Continued.*ONTARIO DIVISION—*Concluded.*

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Port Burwell.....	John Sutherland.....	June 18, 1891..	425 00
" Inner Range.....	".....		50 00
Port Colborne.....	D. H. A. Fortier.....	April 11, 1865..	550 00
Port Colborne F. A.....	Hugh Clarke jr. ....	May 30, 1904..	960 00
Port Credit.....	John Miller.....	Dec. 16, 1897..	180 00
Port Dalhousie.....	Bernard McGrath.....	Oct. 2, 1907..	360 00
Port Dover.....	Silas L. Butler.....	July 15, 1897..	360 00
Port Elgin.....	R. M. Lowry.....	Mar. 4, 1896..	130 00
Port Maitland.....	Mrs. Jas. Grant.....	June 29, 1907..	385 00
Port Stanley.....	John L. Oliver.....	Dec. 16, 1907..	360 00
Presqu'Isle.....	Hugh H. McKenzie.....	May 7, 1907..	205 00
Presqu'Isle Main.....	Hugh E. Smith.....	April 29, 1898..	400 00
Presqu'Isle Main Fog Alarm.....	W. B. Ainsworth.....	Oct. 12, 1907..	600 00
Providence Bay.....	John B. Sinclair.....	Mar. 6, 1906..	325 00
Rains Wharf.....	W. W. Rains.....	Aug. 1892..	75 00
Rainy River.....	Patrick O'Connor.....	June 23, 1904..	300 00
Red Rock.....	Adam Brown.....	June 2, 1909..	475 00
Richards Landing.....	R. Armstrong.....	Feb. 1902..	65 00
Rondeau.....	W. R. Fellows.....	Dec. 18, 1888..	425 00
Rosseau.....	J. G. Dixon.....	July 4, 1890..	130 00
Sailors Encampment.....	A. M. Rains.....	Aug. 1, 1892..	130 00
Salmon Point.....	Anson Shortt.....	Oct. 13, 1909..	300 00
Sand Point.....	Peter McLean.....	May 1, 1909..	50 00
Saugeen.....	Angus McAulay.....	Aug. 23, 1909..	120 00
Scotch Bonnet.....	Cyrus R. Spencer.....	April 7, 1903..	425 00
Shaguiandah.....	Wm. Stevens.....	Jan. 11, 1909..	100 00
Shoal Island.....	John L. McCluskie.....	Sept. 11, 1909..	265 00
Silver Islet.....	Capt. J. Cross.....	May 18, 1905..	130 00
Slate Island.....	A. B. Sutherland.....	July 21, 1908..	510 00
Snake Island.....	John Whitmarsh.....	July 18, 1900..	375 00
Southampton.....	James Brown.....	June 29, 1904..	180 00
South Baymouth.....	John A. Ritchie.....	Sept. 10, 1903..	150 00
South Bay Point.....	Marellus Vorce.....	Nov. 21, 1902..	240 00
South E. Bay.....	Thomas Darling.....	Jan. 31, 1891..	95 00
South River.....	Fredk. Beackler.....	July 2, 1903..	130 00
Squaw Island.....	Neil McDougall.....	April 25, 1901..	240 00
St. Anicet Bar.....	Donald McKillop.....	June 8, 1892..	340 00
Stagg Island.....	Thos. M. Cowan.....		180 00
Stokes Bay.....	Alexander Smith.....	May 14, 1903..	240 00
Strawberry Island.....	William McKenzie.....	May 4, 1893..	385 00
Strawbury Island.....	C. Thompson.....		50 00
Stripling Point.....	David Humes.....	Aug. 27, 1902..	240 00
Sulphur Island.....	J. J. King.....	May 15, 1905..	360 00
Supple Point.....	G. J. Kelly.....	Oct. 11, 1909..	100 00
Success Island.....	Temeskaming Navigation Co.....		
Telegraph Island.....	Geo. A. Rowe.....	Oct. 25, 1895..	240 00
Thames River.....	H. J. Cartier.....	Oct. 18, 1884..	425 00
Thessalon.....	James Harvey.....	Nov. 28, 1897..	385 00
Thornbury.....	Robert Lowe.....	April 12, 1887..	100 00
Thunder Cape.....	William Craig.....	May 17, 1892..	920 00
Tobermory.....	Archibald Currie.....	Oct. 12, 1903..	250 00
Thomas'Island.....	Thomas Sweeney.....	Sept. 19, 1902..	240 00
Toronto, East Pier.....	George McKelvie.....	June 13, 1905..	960 00
Trenton.....	C. W. Spicer.....	May 5, 1909..	120 00
Victoria Island.....	George Cosgrave.....	Nov. 14, 1899..	425 00
Warren Landing.....	Hugh McDonald.....	Aug. 20, 1905..	400 00
Welcome Island.....	Adolphe Perras.....	May 10, 1906..	800 00
Western Islands.....	T. J. Richardson.....	June 27, 1901..	960 00
West Sister Rock.....	John Thibault.....	Dec. 7, 1905..	425 00
Whisky Island and Penetanguishene.....	Christopher Columbus.....	Mar. 18, 1893..	400 00
Whitby.....	Port Whitby Hbr. Co. Ltd..	May 1, 1905..	100 00
Wharton.....	Wm. Gilbert.....	Sept. 13, 1907..	75 00
Wilson Channel.....	H. G. Duncan.....	Aug. 25, 1905..	360 00
Wolf Island.....	Wm. Gillespie.....	Mar. 17, 1885..	250 00



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STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

BRITISH COLUMBIA.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Active Pass.....	H. Georgeson .....	July 21, 1884..	960 00
Amphitrite Point.....	G. W. Grant. ....	April 2, 1906..	270 00
Berens Island.....	S. G. Harrison.....	Nov. 4, 1897..	397 50
Brockton Point.....	W. D. Jones.....	Aug. 20, 1890..	397 50
Brotchie Ledge.....	Thos. Sparks.....	Jan. 1, 1903..	120 00
Bare Point.....	J. Crozier.....	June 12, 1897..	225 00
Ballenas Island.....	M. Brown.....	Oct. 3, 1901..	960 00
Birnie Island.....	C. Rudge.....	May 2, 1905..	270 00
Balfour.....	J. W. Gallup.....	Jan. 1, 1900..	150 00
Cape Beale .....	W. L. Thompson.....	Sept. 16, 1908..	1,380 00
Carmanah Point.....	W. P. Daikin.....	Nov. 4, 1890..	1,440 00
Cape Mudge.....	J. Davidson.....	June 27, 1898..	450 00
Coffin Island.....	No keeper.....		
Crofton Light.....	R. Allan.....	May 31, 1907..	195 00
Discovery Island.....	M. A. Croft.....	April 1, 1902..	960 00
Dryad Point.....	C. Carpenter.....	Nov. 7, 1899..	397 50
Dock Island .....	Hugh Moore.....	May 15, 1903..	270 00
Danger Reef.....	R. Harrap.....	April 15, 1903..	150 00
Denman Island .....	J. A. McMillan.....	Aug. 15, 1906..	450 00
Entrance Island .....	M. G. Clark.....	Nov. 26, 1897..	1,200 00
Egg Island.....	Jas. Forsythe.....	July 10, 1909..	1,200 00
Estevan Point.....	J. P. Jensen.....	April .. 1907..	1,450 00
Fisgard.....	J. Gosse.....	Oct. 13, 1909..	360 00
Fiddle Reef.....	D. H. McNeill.....	Mar. 21, 1905..	450 00
Fraser River Lights and Garry Pt.....	A. A. Parker.....	July 1, 1907..	450 00
Gallows Point.....	Western Fuel Co.....	May .. 1906..	120 00
Green Island.....	S. Baker.....	June 21, 1907..	1,200 00
Helen Point .....	Daniel Tom.....	Mar. 2, 1910..	120 00
Ivory Island.....	F. Reuter.....	May 2, 1905..	960 00
Kyuquot Light.....	A. Ellis.....	Jan. 21, 1906..	270 00
Kootenay Landing .....	C. P. R. Co.....		120 00
Lawyer Island.....	F. W. B. Elsterman.....	April 1, 1905..	600 00
Lennard Island.....	R. Pollock.....	July 1, 1908..	1,550 00
Lucy Island.....	A. E. Allen.....	May 12, 1908..	510 00
Merry Island.....	W. T. Franklin.....	Jan. 8, 1904..	450 00
North Arm Lights .....	James Quinn.....	Apr. 1, 1909..	225 00
Nanaimo Harbour.....	H. B. Shaw.....	June 12, 1907..	225 00
Point Atkinson.....	W. Erwin.....	Oct. 5, 1880..	1,300 00
Portlock Point.....	W. J. Gillespie.....	Nov. 1905..	487 50
Prospect Point.....	Jno. Grove.....	July 7, 1898..	397 50
Pointer Island .....	Jas. Codville.....	Dec. 26, 1899..	487 50
Portier Pass.....	F. Allison .....	Nov. 15, 1902 ..	500 00
Proctor.....	G. W. Gallup.....	Jan. 1, 1900..	270 00
Pilot Bay.....	E. Montreuil.....	Oct. 17, 1907..	500 00
Pine Island .....	A. B. Gurney.....	April 1, 1907..	1,440 00
Pultney Point .....	E. Hukkla (Temporary).....	Feb. 1, 1907 ..	500 00
Pachena Point.....	W. R. Pillar .....	Sept. 5, 1907..	1,550 00
Quatsino Light.....	N. C. Nelson .....	Jan. 29, 1907..	360 00
Race Rocks.....	F. Eastwood.....	" 21, 1891..	1,440 00
Saturna Island.....	Jas. Georgeson.....	Oct. 26, 1889..	690 00
Sand Heads Lt. Ship.....	M. O'Brien.....	" 1, 1904..	1,200 00
Sisters.....	B. Blanchard.....	Feb. 20, 1905..	960 00
Sechelt .....	Gas Beacon (No keeper).....		
Scarlet Point.....	Wm. Hunt.....	Sept. 24, 1908..	397 50
Sechart Light.....	G. Strickland.....	Mar. 27, 1908..	195 00
Sooke Light.....	A. Codel.....	April 15, 1907..	150 00
Trial Island.....	H. O'Kell .....	Aug. 20, 1906..	1,200 00
Victoria Harbour .....	Thos. Sparks.....	Jan. 29, 1903..	180 00
Walker Rock.....	Gas Light (No keeper).....		
Yellow Island.....	John Doney .....	May 1, 1905..	765 00



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STATEMENT giving Names of Stations and Lightkeepers, &c.—Continued.

MANITOBBIA.

Name of Station.	Name of Lightkeeper.	Appointed.	Salary.
			\$ cts.
Black Bear Island. ....	Wm. Hughes.....	Feb. 12, 1892..	400 00
Cox Reef.....	Wm Doré.....	Jan. 11, 1886..	100 00
George Island.....	T. Fjeldsted.....	May 6, 1904..	180 00
Gull Harbour.....	A. A. Tashe. McKay.....	June 30, 1909..	340 00
Red River Range.....	William Hughes.....	Feb. 12, 1892..	400 00
Warren Landing Ranges.....	Hugh McDonald. . . . .	Aug. 14, 1907 .	800 00

APPENDIX No. 23.

CRUISE OF THE "ARCTIC" TO NORTHERN WATERS DURING 1908-09  
COMMISSION ISSUED TO CAPTAIN JOSEPH ELZEAR BERNIER.

C. FITZPATRICK,  
23--7--06,  
Deputy Governor of Canada.

CANADA.

EDWARD THE SEVENTH, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.

To Captain Joseph Elzéar Bernier, of the City of Ottawa, in the Province of Ontario, in our Dominion of Canada,

GREETING:

Know You, that reposing trust and confidence in your loyalty, integrity and ability, we have constituted and appointed, and we do hereby constitute and appoint you, the said JOSEPH ELZEAR BERNIER, to be the officer in charge of the Canadian Government ship "ARCTIC".

TO HAVE, HOLD, EXERCISE AND ENJOY the said office of officer in charge of the Canadian Government ship "ARCTIC" unto you the said JOSEPH ELZEAR BERNIER, with all and every the powers, rights, authority, privileges, profits, emoluments and advantages unto the said office of right and by law appertaining during our pleasure.

IN TESTIMONY WHEREOF, we have caused our letters to be made patent and the Great Seal of Canada to be hereunto affixed.

WITNESS, the Honourable Charles Fitzpatrick, Deputy of our Right Trusty and Well-beloved Cousin the Right Honourable Sir Albert Henry George, Earl Grey, Viscount Howick, Baron Grey of Howick, in the County of Northumberland, in the



1 GEORGE V., A. 1911

Peerage of the United Kingdom, and a Baronet; Knight Grand Cross of our Most Distinguished Order of Saint Michael and Saint George, &c., &c., Governor General of Canada.

At our Government House, in our city of Ottawa, this twenty-third day of July, in the year of our Lord One thousand nine hundred and six, and in the sixth year of our reign.

By Command,

F. COLSON,  
*Acting Under Secretary of State.*

C. FITZPATRICK,  
23—7—06,  
Deputy Governor General of Canada.

### CANADA.

EDWARD THE SEVENTH, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.

To Captain Joseph Elzéar Bernier, of the City of Ottawa, in the Province of Ontario, in our Dominion of Canada,

#### GREETING:

A. POWER,  
Acting Deputy Minister of Justice,  
Canada.

Know You, that reposing trust and confidence in your loyalty, integrity and ability, we have constituted and appointed, and we do hereby constitute and appoint you, the said JOSEPH ELZEAR BERNIER, to be a fishery officer under the Fisheries Act and any Act in amendment thereof, and under the Act intituled: 'An Act Respecting Fishing by Foreign Vessels.'

TO HAVE, HOLD, EXERCISE AND ENJOY the said office of a fishery officer, unto you, the said JOSEPH ELZEAR BERNIER, with all and every the powers, rights, authority, privileges, emoluments and advantages unto the said office of right and by law appertaining during pleasure, and with full power and authority to exercise the functions, power and jurisdiction of a justice of the peace for the purposes of the said 'Acts' or any of them, and of any regulations made or continued thereunder or in respect thereto.

In Testimony Whereof, we have caused these our letters to be made patent, and the Great Seal of Canada to be hereunto affixed.

WITNESS, the Honourable Charles Fitzpatrick, Deputy of our Right Trusty and Right Well-beloved Cousin the Right Honourable Sir Albert Henry George, Earl Grey, Viscount Howick, Baron Grey, of Howick, in the County of Northumberland, in the Peerage of the United Kingdom, and a Baronet; Knight Grand Cross of our Most Distinguished Order of Saint Michael and Saint George, &c., &c., Governor General of Canada.

At our Government House, in our city of Ottawa, this Twenty-third day of July, in the year of our Lord One thousand nine hundred and six, and in the sixth year of our reign.

By Command,

F. COLSON,  
*Acting Under Secretary of State.*



SESSIONAL PAPER No. 21

## SHIP'S COMPANY OF THE "ARCTIC."

## OFFICERS.

Captain J. E. Bernier, Commander.  
 George Braithwaite, First Officer.  
 O. J. Morin, Second Officer.  
 C. W. Green, Third Officer.

J. V. Koenig, Chief Engineer.  
 Emile Bolduc, Second Engineer.  
 W. H. Weeks, Purser.

## SCIENTIFIC STAFF.

J. Bolduc, Medical Officer.  
 F. Vanasse, Historiographer.  
 W. E. Jackson, Meteorologist.

J. G. McMillan, Geologist.  
 Frank Hennessey, Assistant Naturalist.

## CREW.

Gédéon Gagné, Carpenter.  
 William Johnson, Boatman.  
 J. Thibault, Chief Steward.  
 I. Bégin, Cook.  
 George Lessard, Quartermaster.  
 Arthur Desjardins, Quartermaster.  
 Napoléon Chasse, Quartermaster.  
 Claude Vigneau, Quartermaster.  
 E. Lahaye, Oiler.  
 A. Bourget, Oiler.  
 A. Robitaille, Second Steward.  
 W. Vaillancourt, Second Cook.  
 G. Groselin, Fireman.  
 Jos. Leclair, Fireman.  
 D. Robson, Fireman.  
 Reuben Pike, Waiter.

J. Goulet, Waiter.  
 Thomas Holden, A.B. Seaman.  
 Thomas White, A.B. Seaman.  
 Daniel Lane, A.B. Seaman.  
 Swen Anderson, A.B. Seaman.  
 William LeBel, A.B. Seaman.  
 Alphe Bouchard, A.B. Seaman.  
 T. W. Burk, A.B. Seaman.  
 John Simms, A.B. Seaman.  
 William Doyle, A.B. Seaman.  
 Henry Wakeham, A.B. Seaman.  
 Joseph Bodeker, A.B. Seaman.  
 James Brace, A.B. Seaman.  
 Louis Wistle, A.B. Seaman.  
 P. Tremblay, A.B. Seaman.

## REPORT OF CAPTAIN J. E. BERNIER.

OTTAWA, April 5, 1910.

G. J. DESBARATS, Esq.,  
 Deputy Minister of Marine and Fisheries,  
 Ottawa.

SIR,—I have the honour to submit my report of the voyage of the Dominion steamer *Arctic*, to the northern waters of this continent, for the purpose of patrolling the waters contiguous to that part of the Dominion of Canada already annexed, and for the further purpose of annexing territory of British possessions as far west as longitude 141 degrees.

I have great pleasure in mentioning that with the valuable assistance of the officers, staff and crew of the *Arctic*, I was able to successfully patrol and cruise in the following waters, viz.: Davies strait, Baffin bay, Melville bay, Smith sound, Lancaster sound, Barrow strait, Melville sound, McClure strait; and on returning, to winter in Winter harbour, Melville island. During our stay at Winter harbour two parties were twice sent to Banks island and Victoria island to annex those islands and search for cairns erected by McClure, in which he left records. Leaving Winter harbour on August 12, 1909, we explored and sounded Byam Martin channel and Austin channel as far as Hotspur point, where we left records. We then sailed down Austin channel into Barrow



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strait, along Lancaster sound, and into Navy Board inlet and into Ponds inlet. From Ponds inlet, we patrolled the east coast of Baffin bay land with a view of meeting whaling vessels, two of which we met, and issued to them licenses.

From there, we visited Cumberland gulf, issued four licenses to stations, and from that point sailed to Cape Haven in search of the wrecked crew of the *Snowdrop*. From Cape Haven we sailed to Port Burwell and then into Hudson strait as far as Ashe inlet, which we entered and constructed beacons; returning from that point to Port Burwell, and from that harbour steamed along the Labrador coast to the Strait of Belle isle, and thence to Quebec, where we arrived on October 5, 1909, all well.

I have prepared a detailed report which includes the report on the annexation of northern lands. The report of the Geologist and Meteorologist and other members of the staff of the *Arctic* will be published in the account of the cruise of the *Arctic*.

I have the honour to be, sir,

Your obedient servant,

J. E. BERNIER.

*Commanding Officer of the 'Arctic' Expedition.*







Bridge on West Coast trail at Shelter Bight, Vancouver Island,  
to Banfield life-saving station.









Batiscan, Que., front range lighthouse.







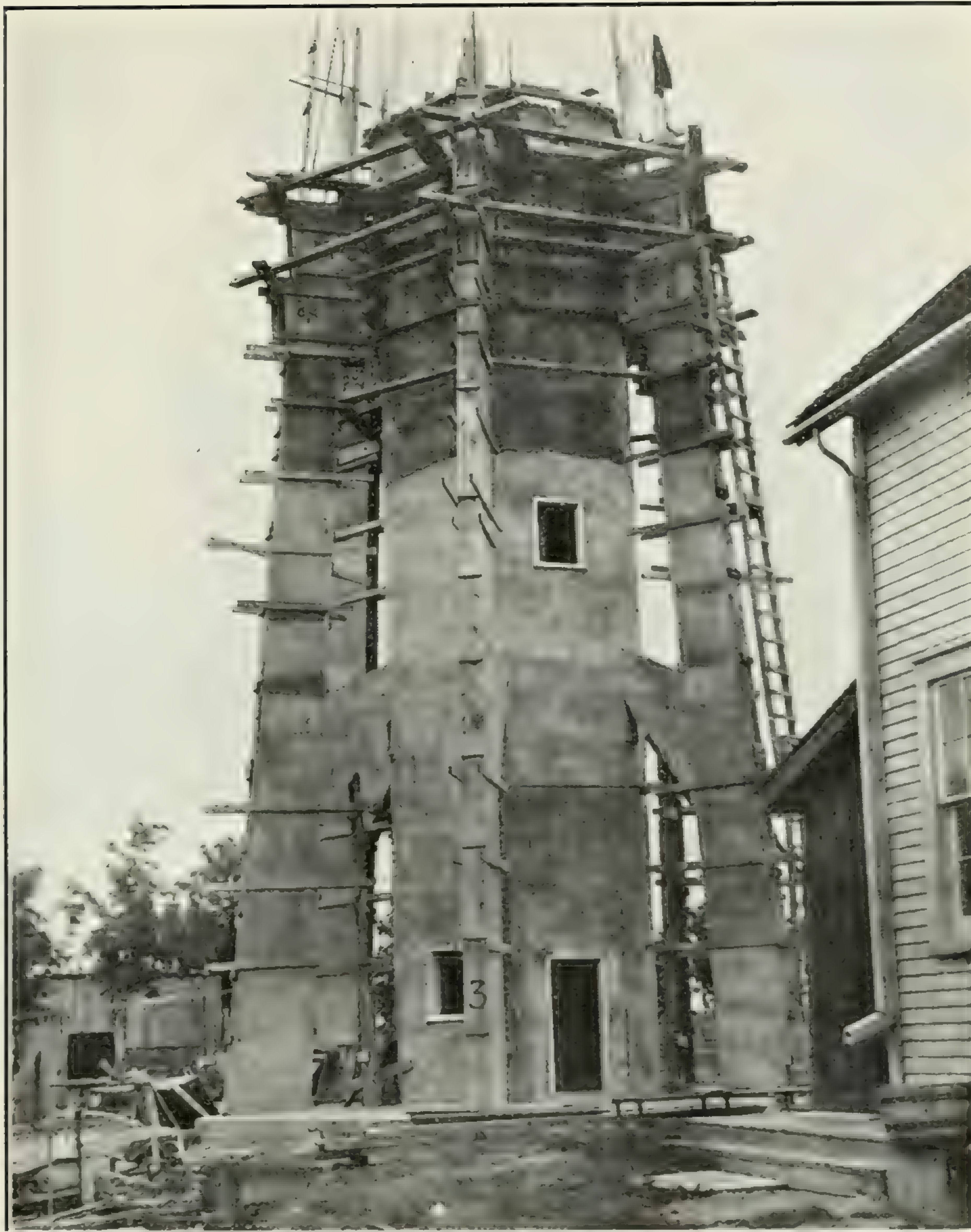


Heath Point lighthouse, Anticosti.









Caribou Island, Lake Superior, reinforced concrete lighthouse under construction.









Hope Island Lightstation, Georgian Bay.







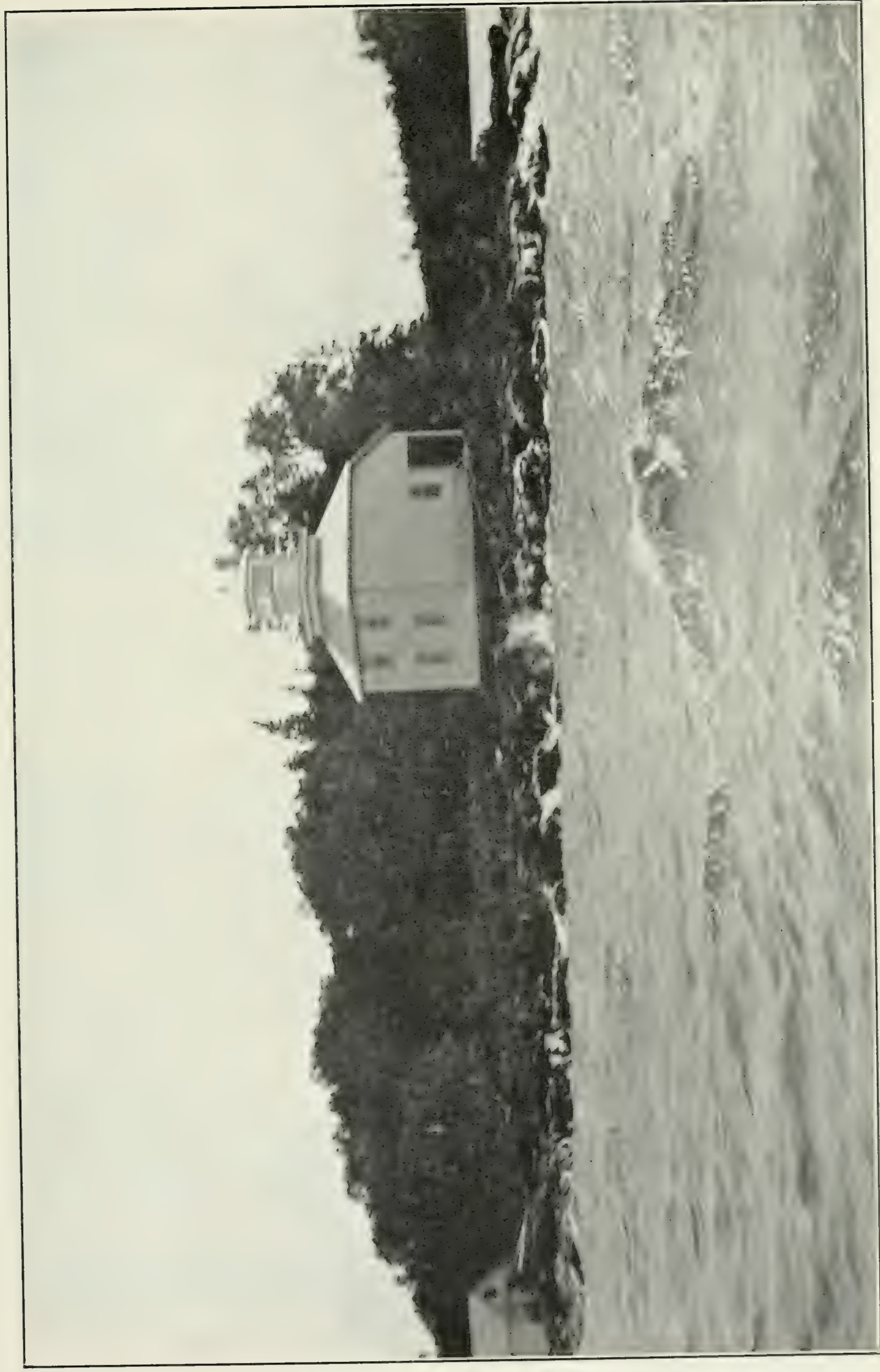


Estevan lighthouse, B.C.









Shagamash lighthouse, Lake Superior.









C. G. Ice-breaker "Lady Grey" breaking up heavy bank of piled ice at White Buoy curve, Lake St. Peter, March, 1910.

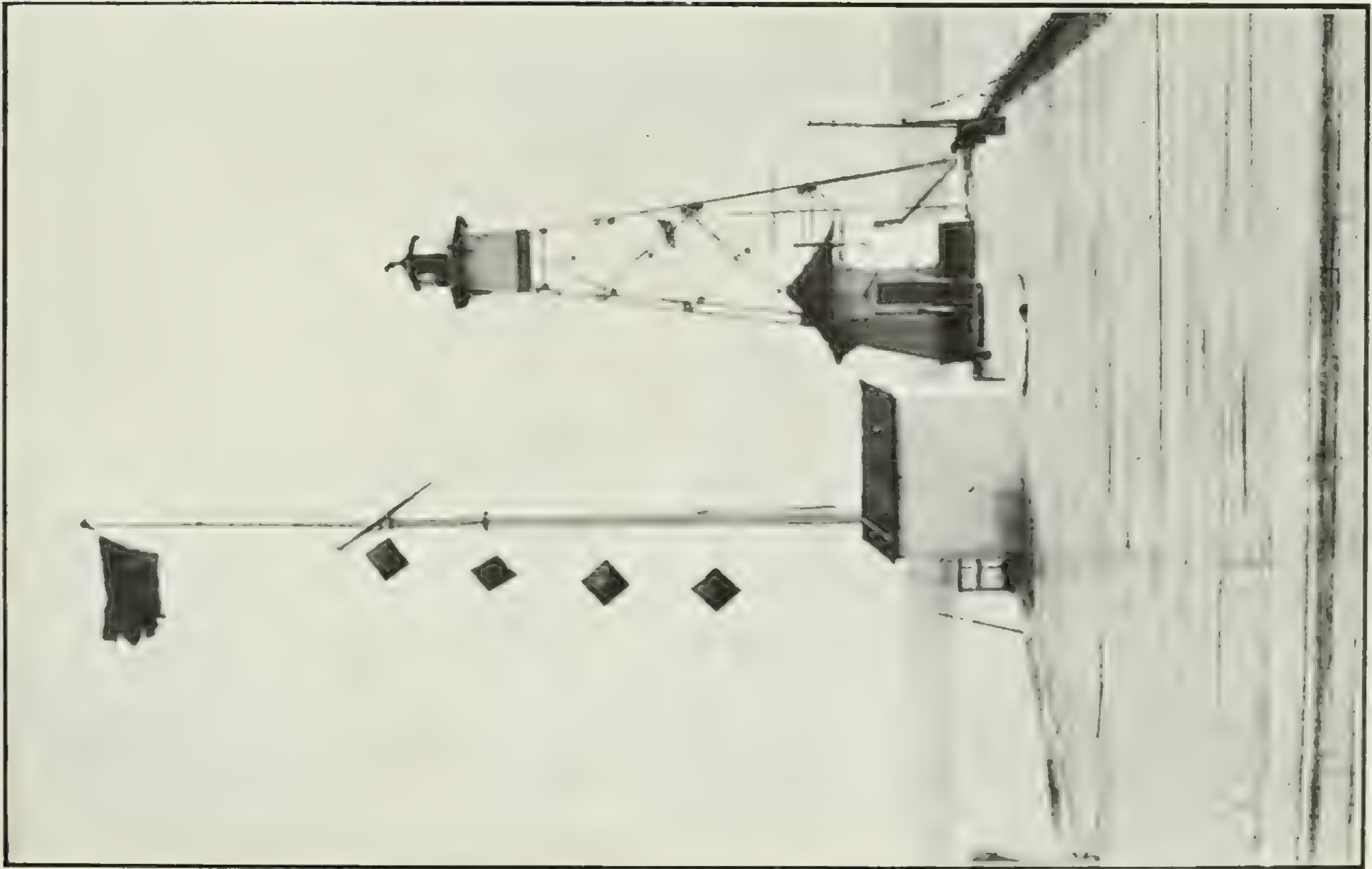


C. G. Ice-breaker "Montcalm," Lake St. Peter, March, 1910.









Signal Station and Lighthouse on Crane Island Wharf, below Quebec, also Semaphore for giving height of water to dredges.

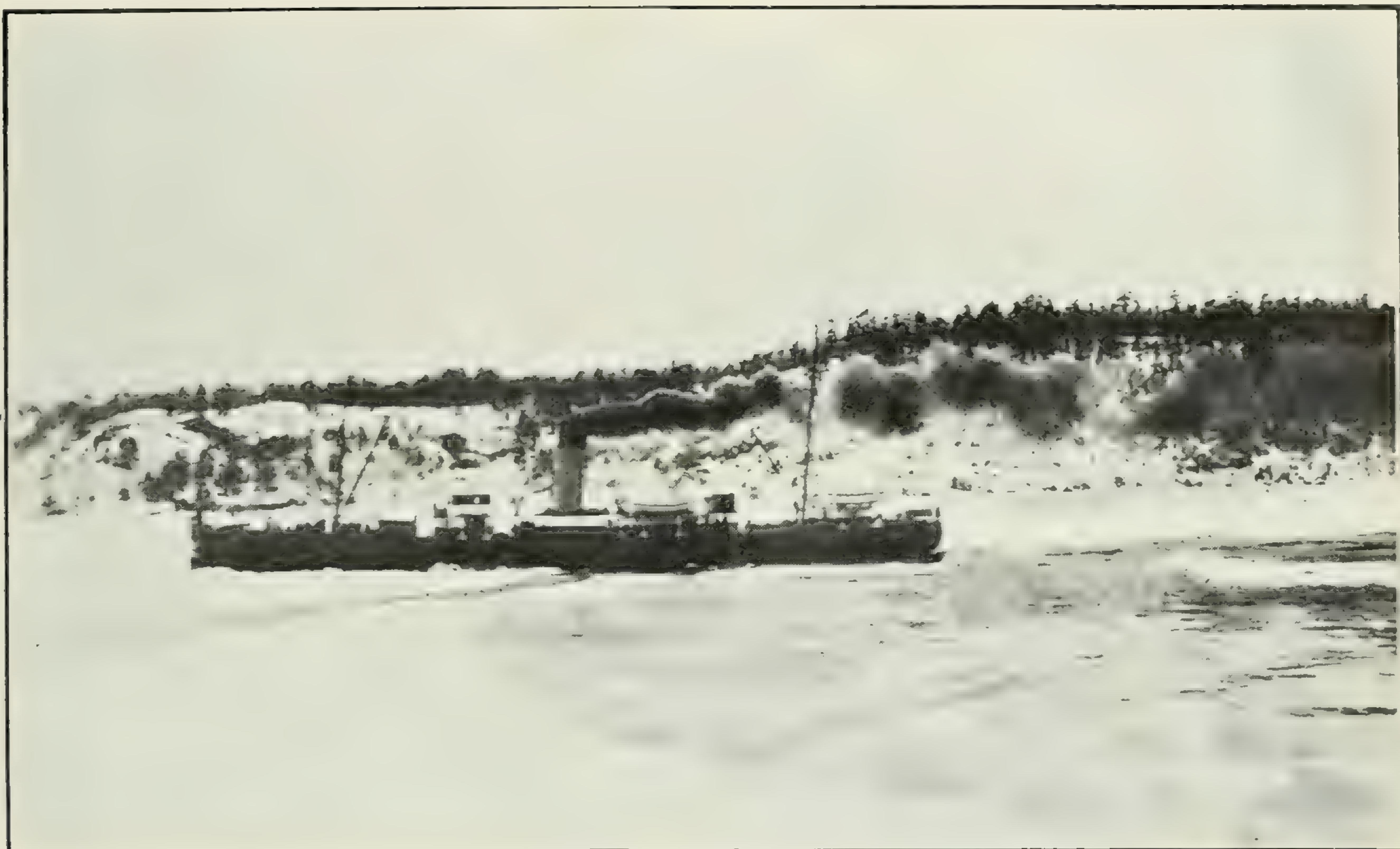


C. G. Ice-breaker "Lady Grey," Lake St. Peter, March, 1910.









C. G. Ice-breaker "Montcalm" in ice jam at Cap Rouge, March 15, 1910.

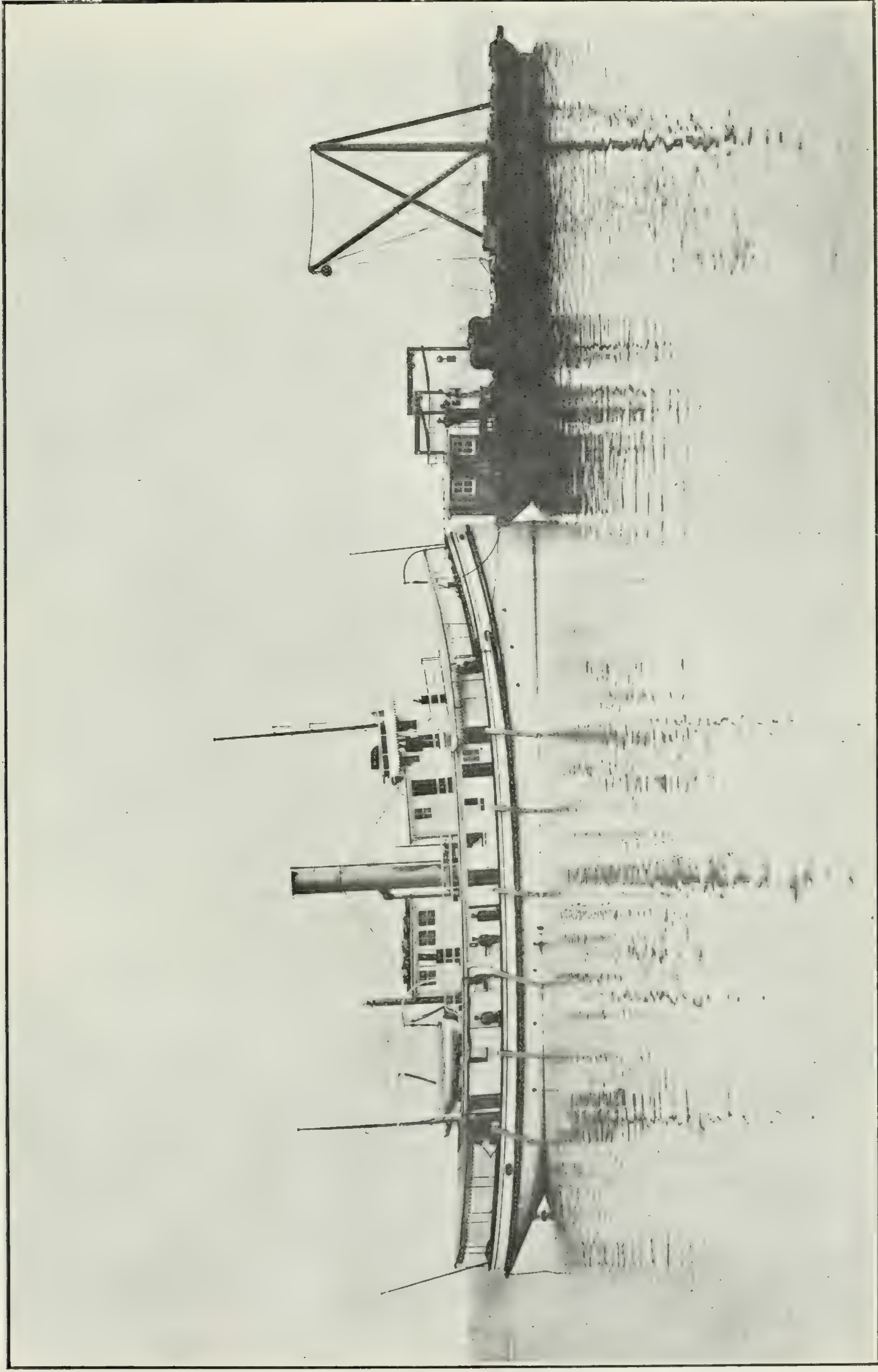


Heavy bank of piled ice at White Buoy curve, Lake St. Peter, March, 1910.







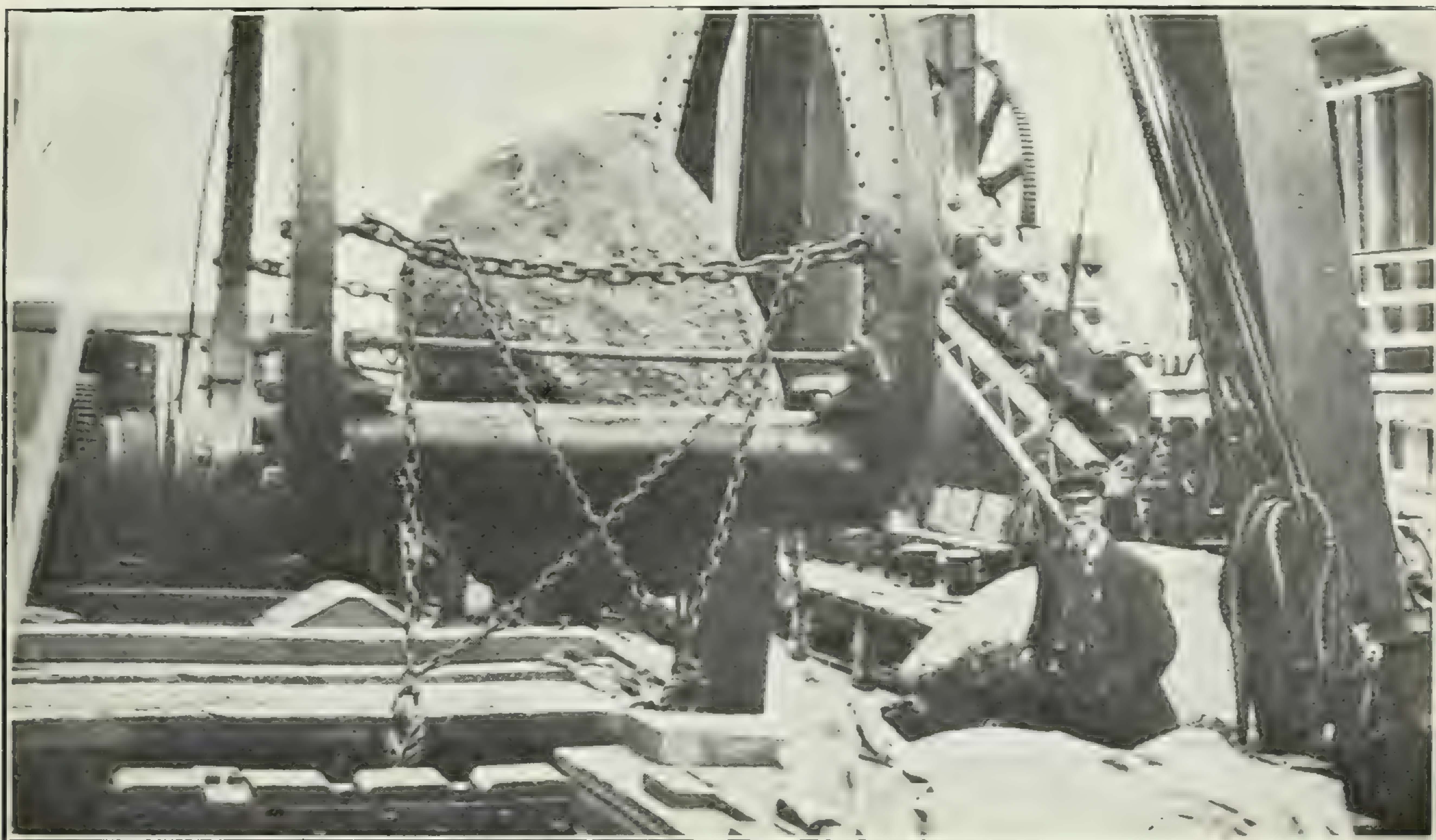


One of the Ship Channel sweeping outfits.









Stone-lifter No. 3 lifting boulders at Cap à la Roche.



Ship Channel Floating Machine Shop.









Showing method of putting in tamarac poles during the winter, to mark dredging limits on Lake St. Peter.









C. G. Ice-breaker "Lady Grey," Lake St. Peter, March, 1910.

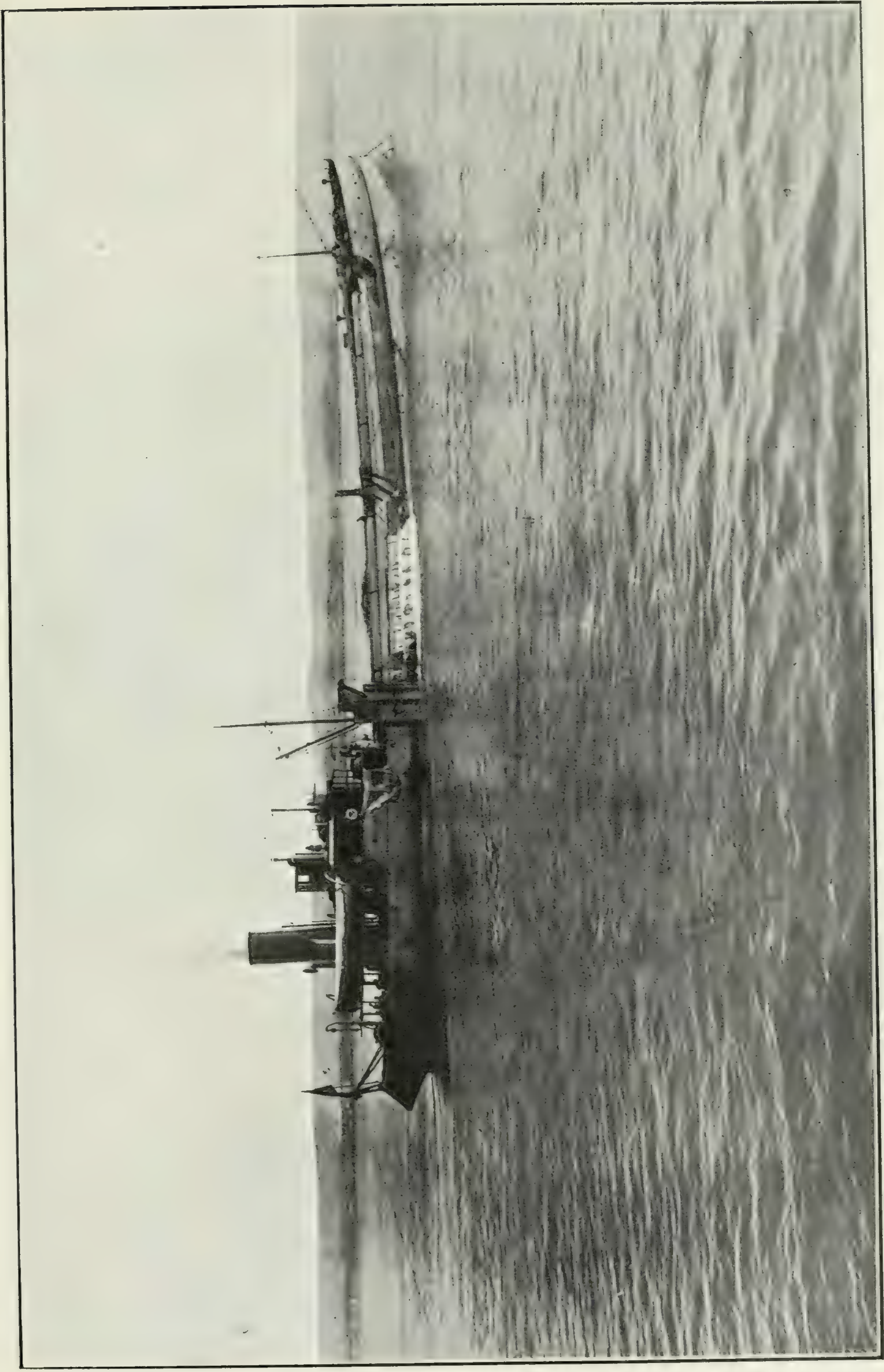


C. G. Ice-breaker "Lady Grey" breaking up heavy bank of piled ice at White Buoy curve.  
Lake St. Peter, March, 1910.







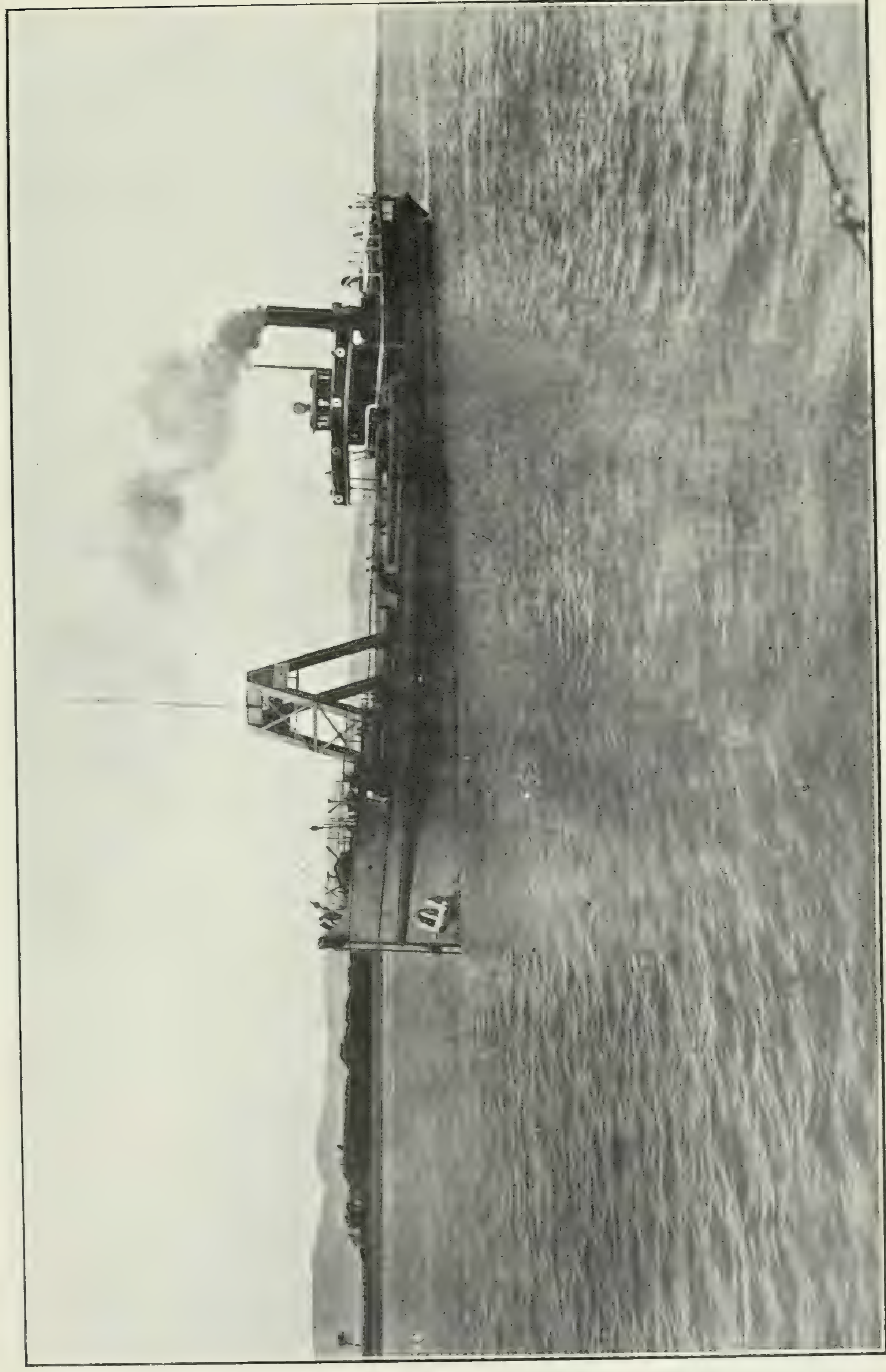


Sand Pump Hopper Sea-going Dredge No. 9 working at Beaujeu Channel, below Quebec.







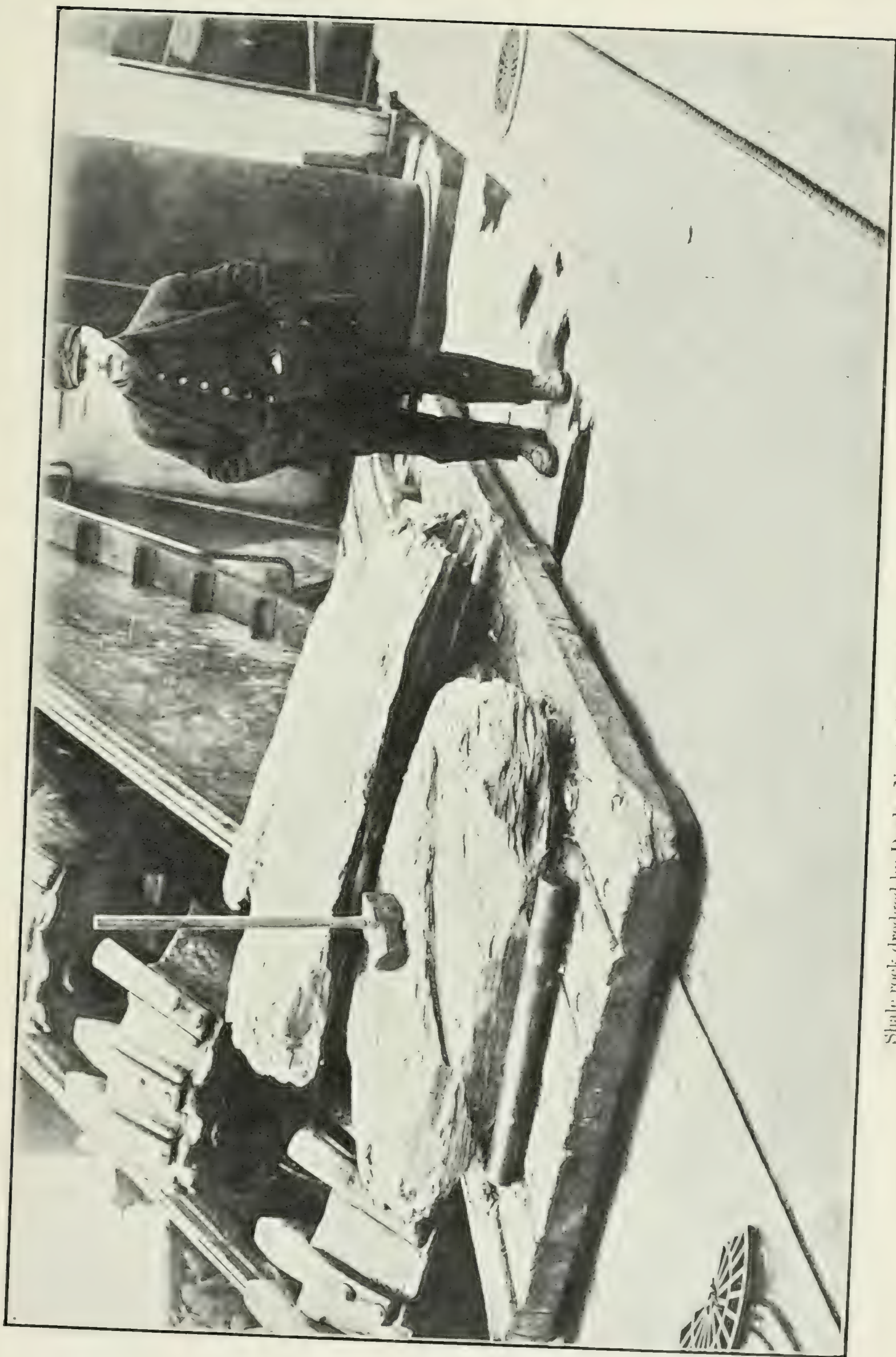


Hydraulic Hopper Sea-going Dredge No. 8 working at St. Thomas Bank, below Quebec.







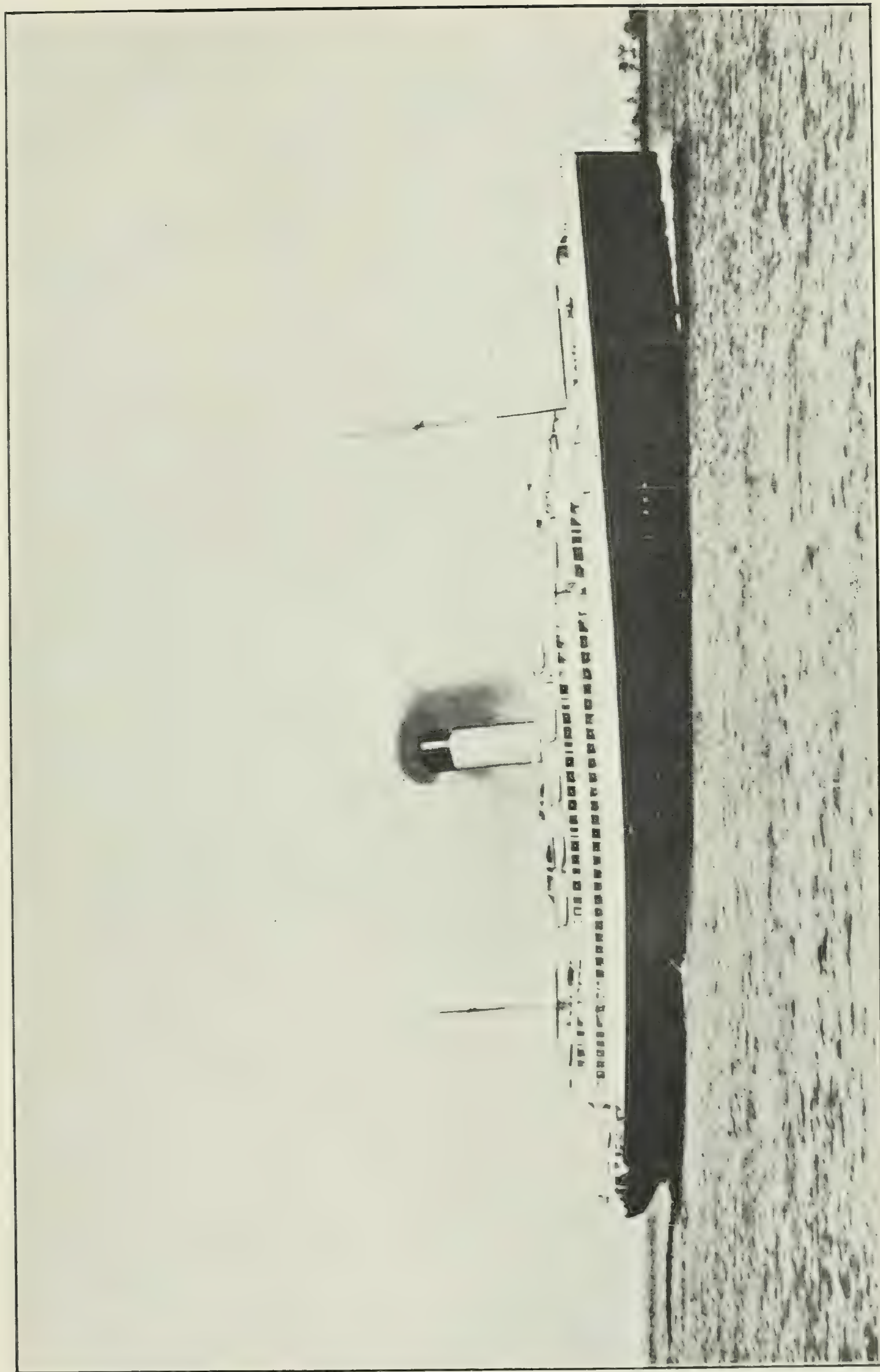


Shale rock dredged by Dredge No. 3 without the aid of explosives, at Cap Charles.







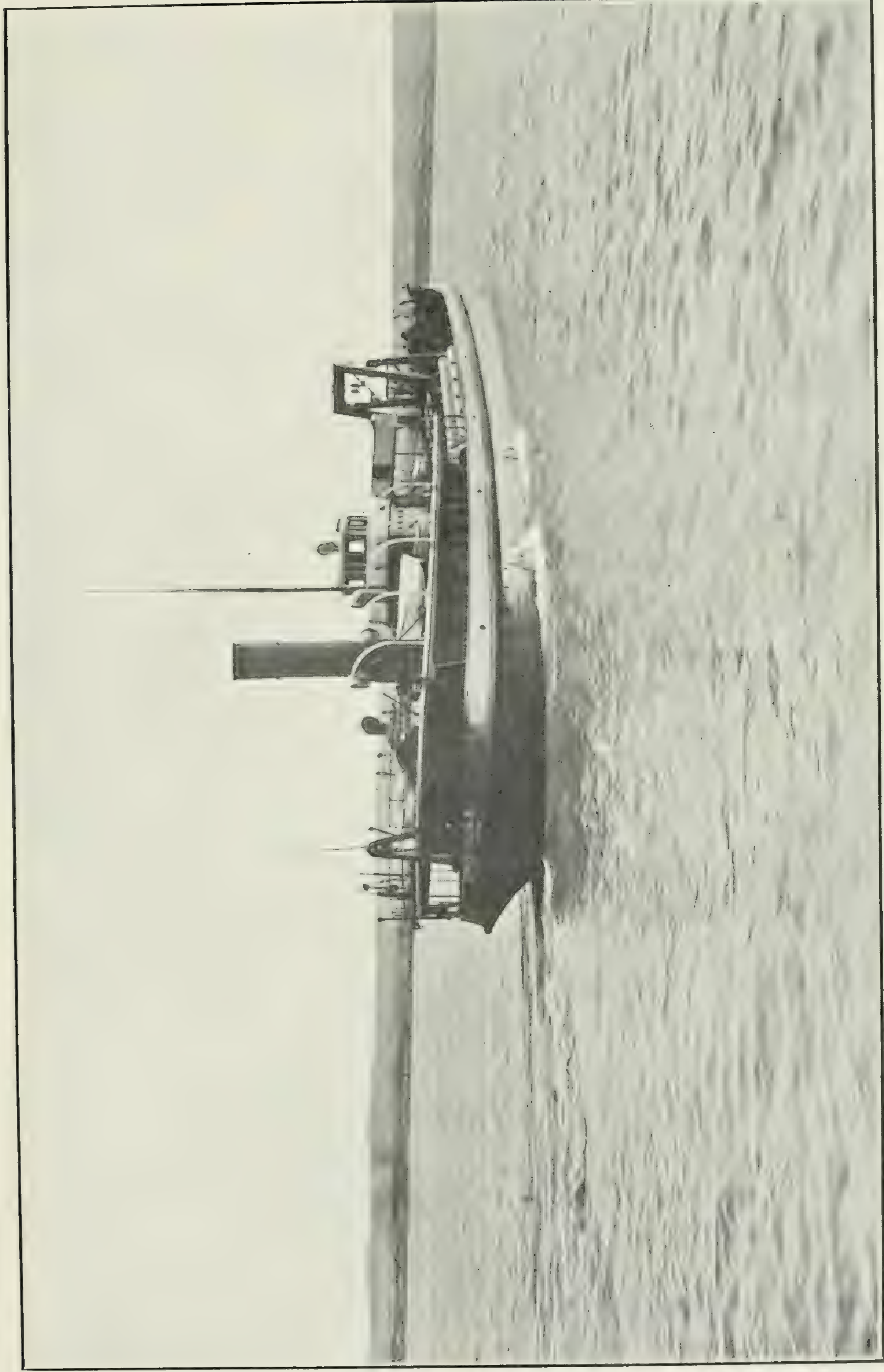


The latest acquisition to the St. Lawrence Route, SS. "Laurentie," 15,000 tons, opposite Pointe aux Trembles (en haut).









Hydraulic Dredge No. 8 off to the dumping ground.

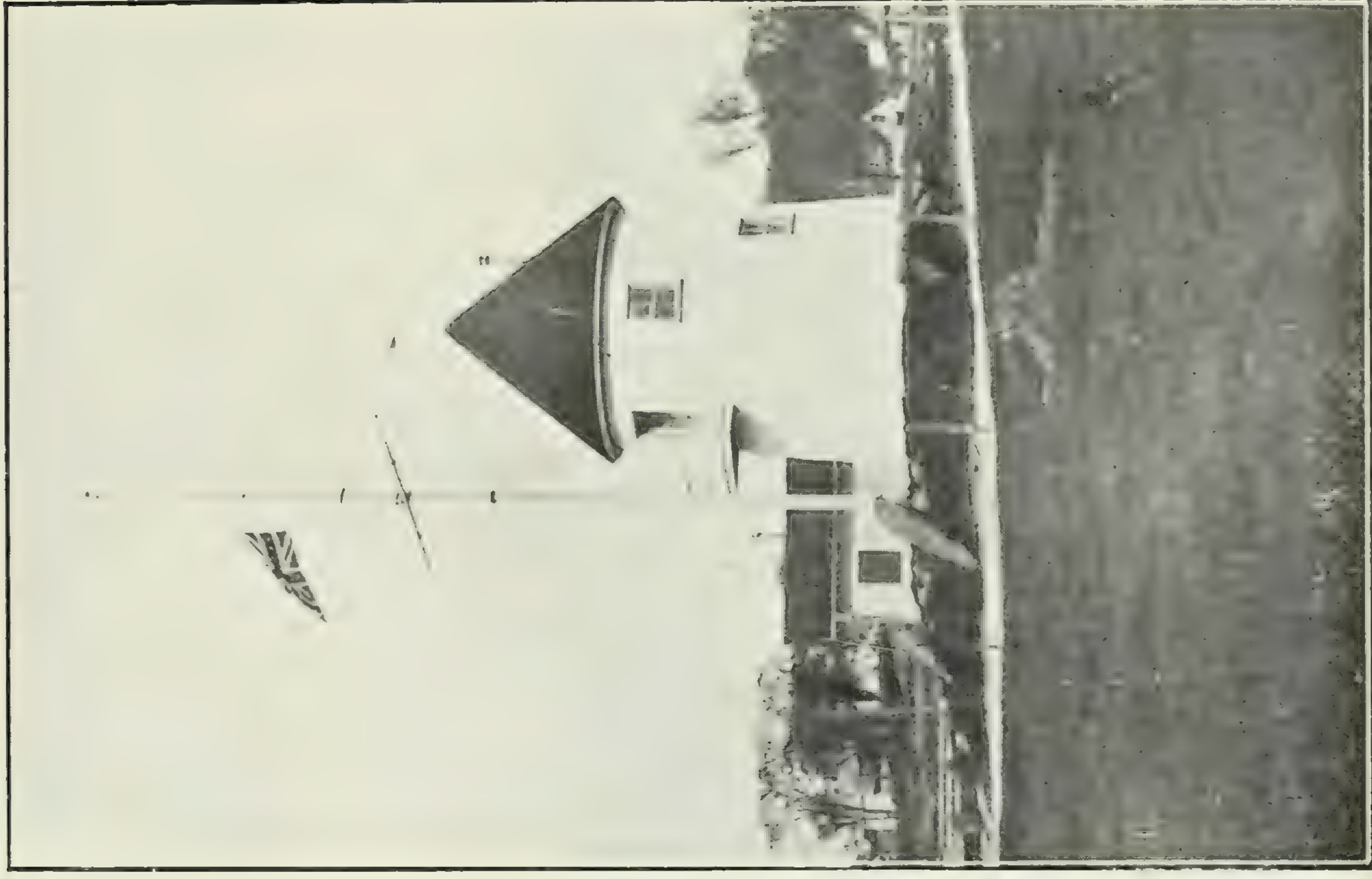








Signal Station at Batiscaan, P.Q.

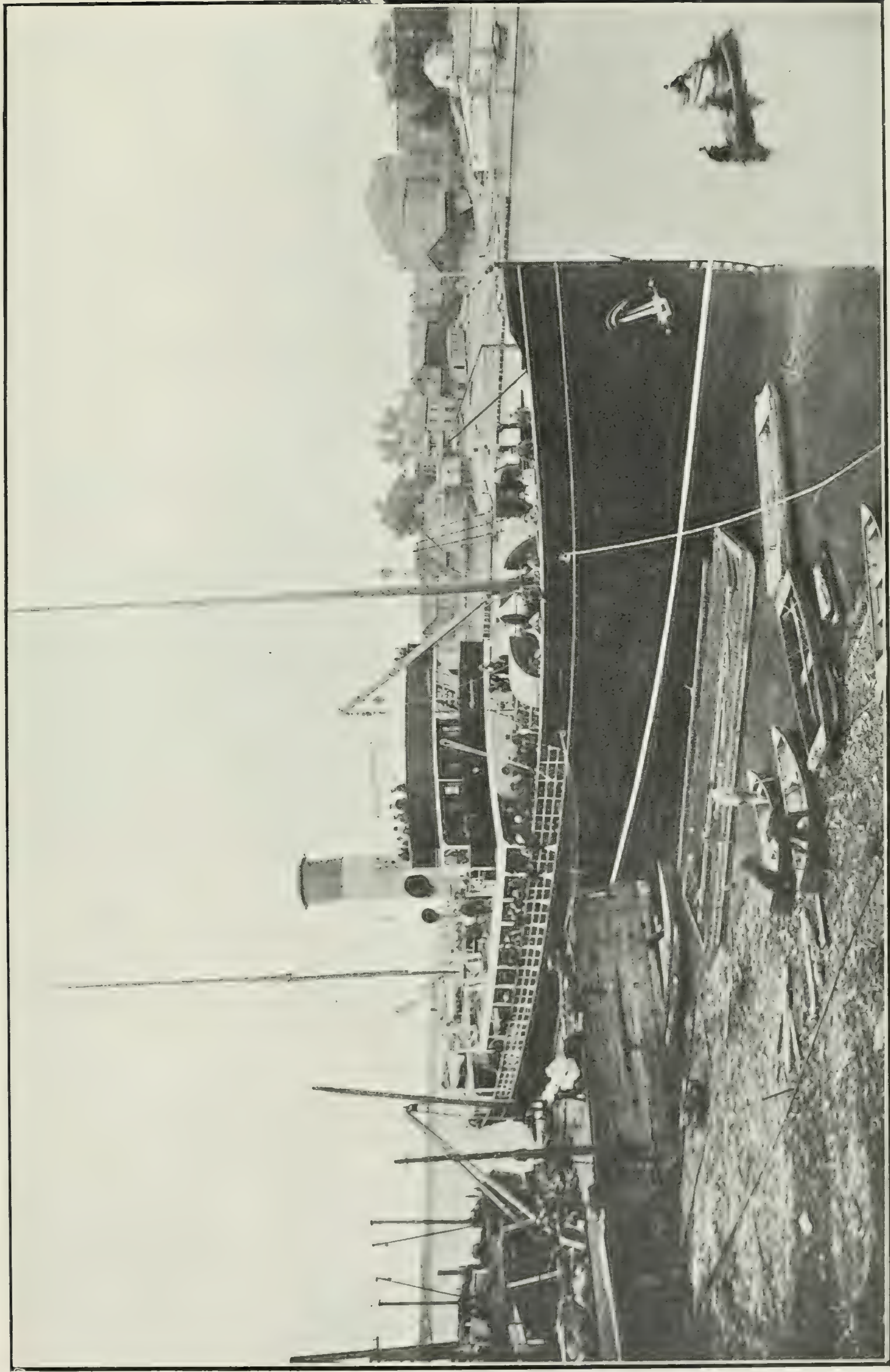


Old Vercheres Wind-mill built in 1690, which has been restored,  
and now used as a Signal Station.







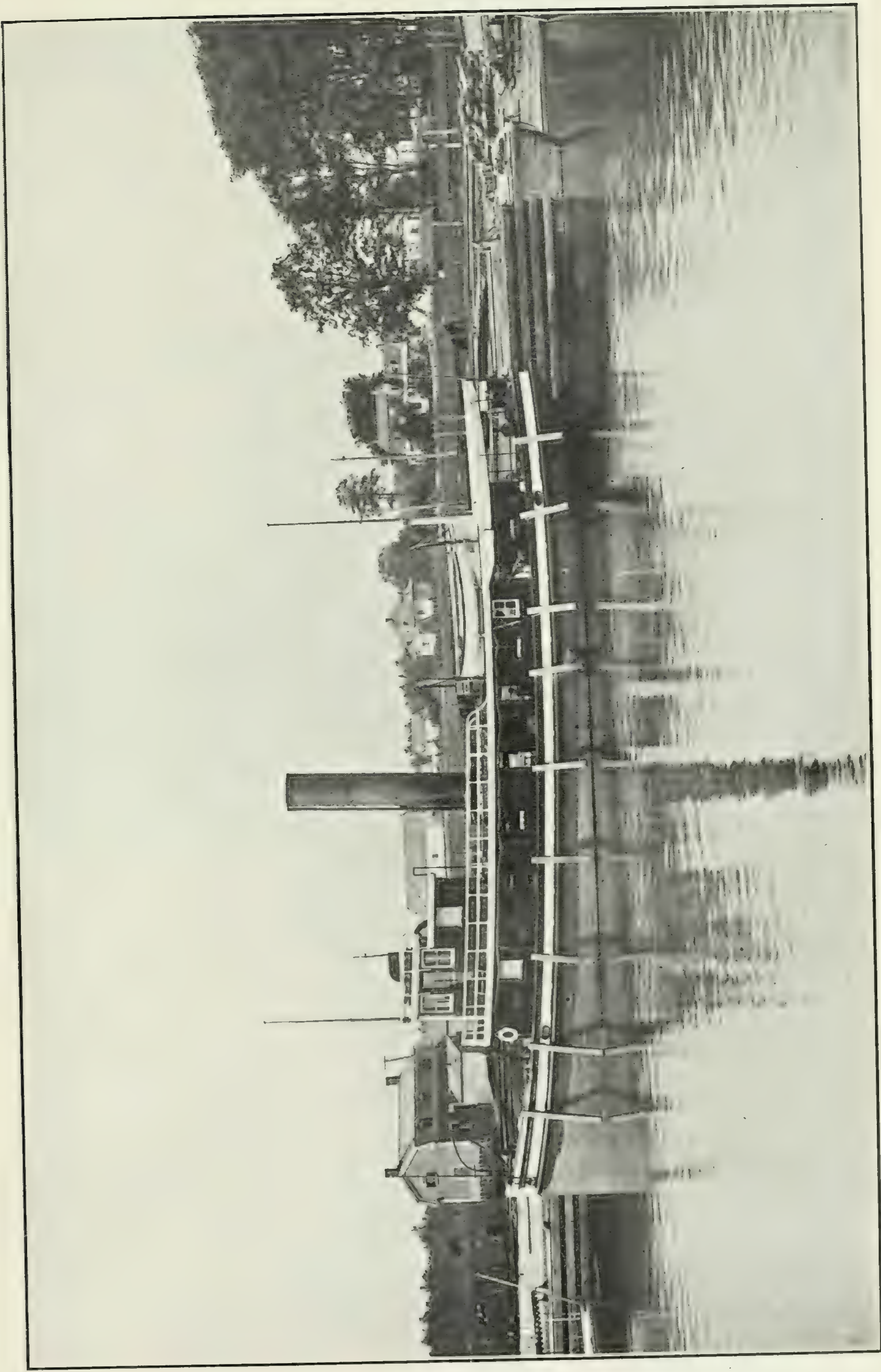


C. G. Ste. "Montmagny."







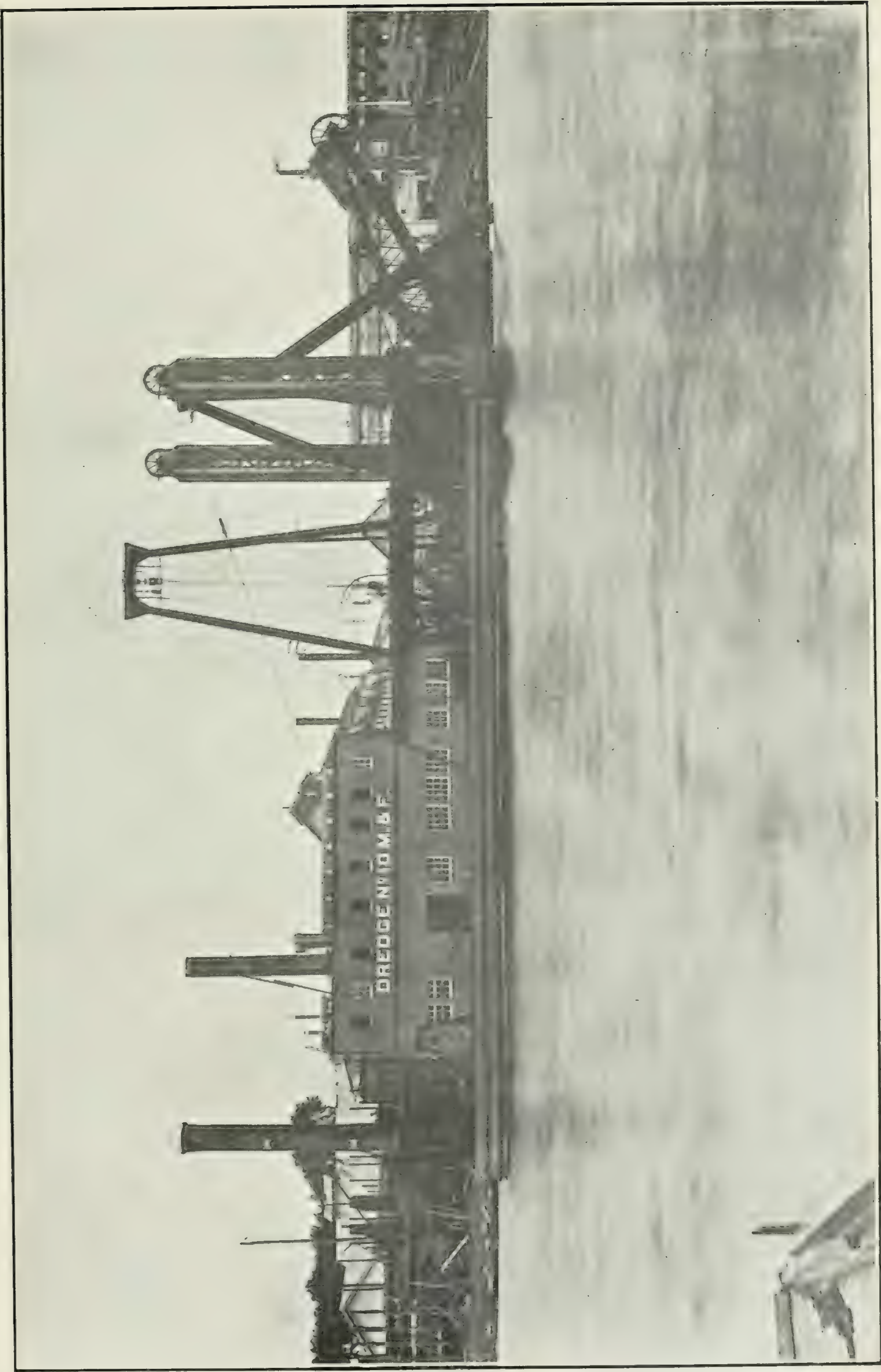


Tug "Contrecoeur".









Dredge No. 10 at Sorel.







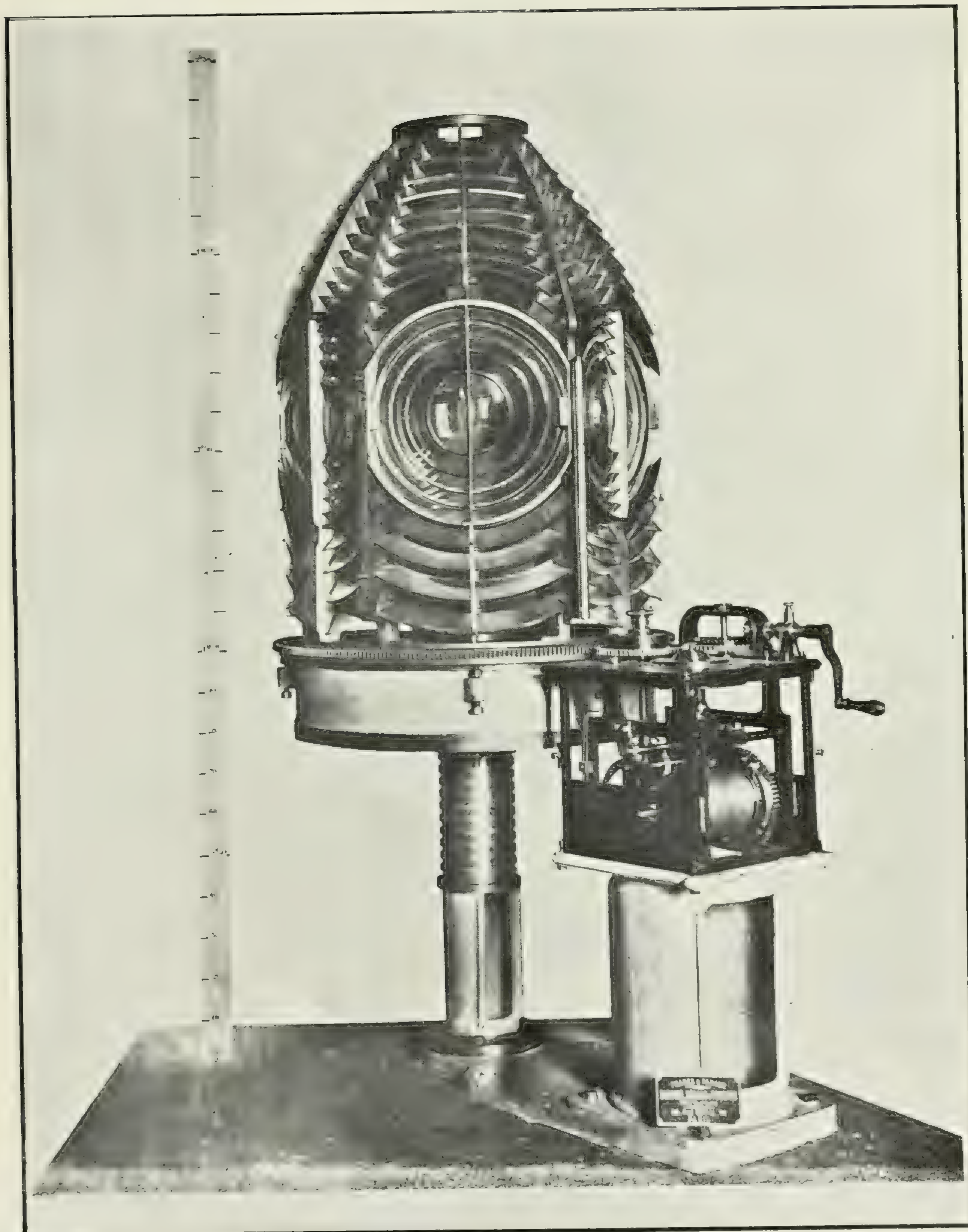


Stone Lifter.







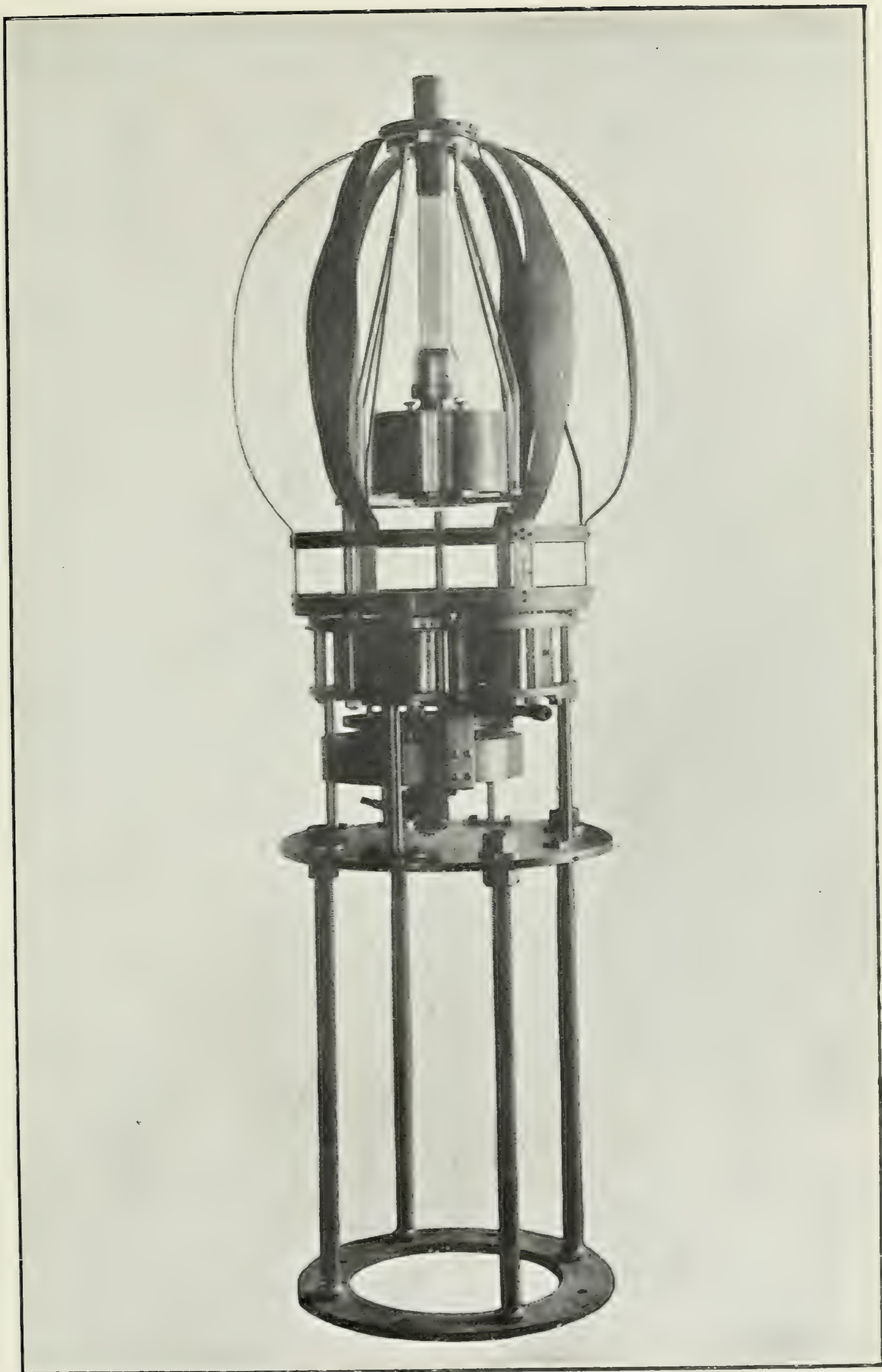


Lightning-light apparatus of the 3rd order, small size, showing a single flash every five seconds.







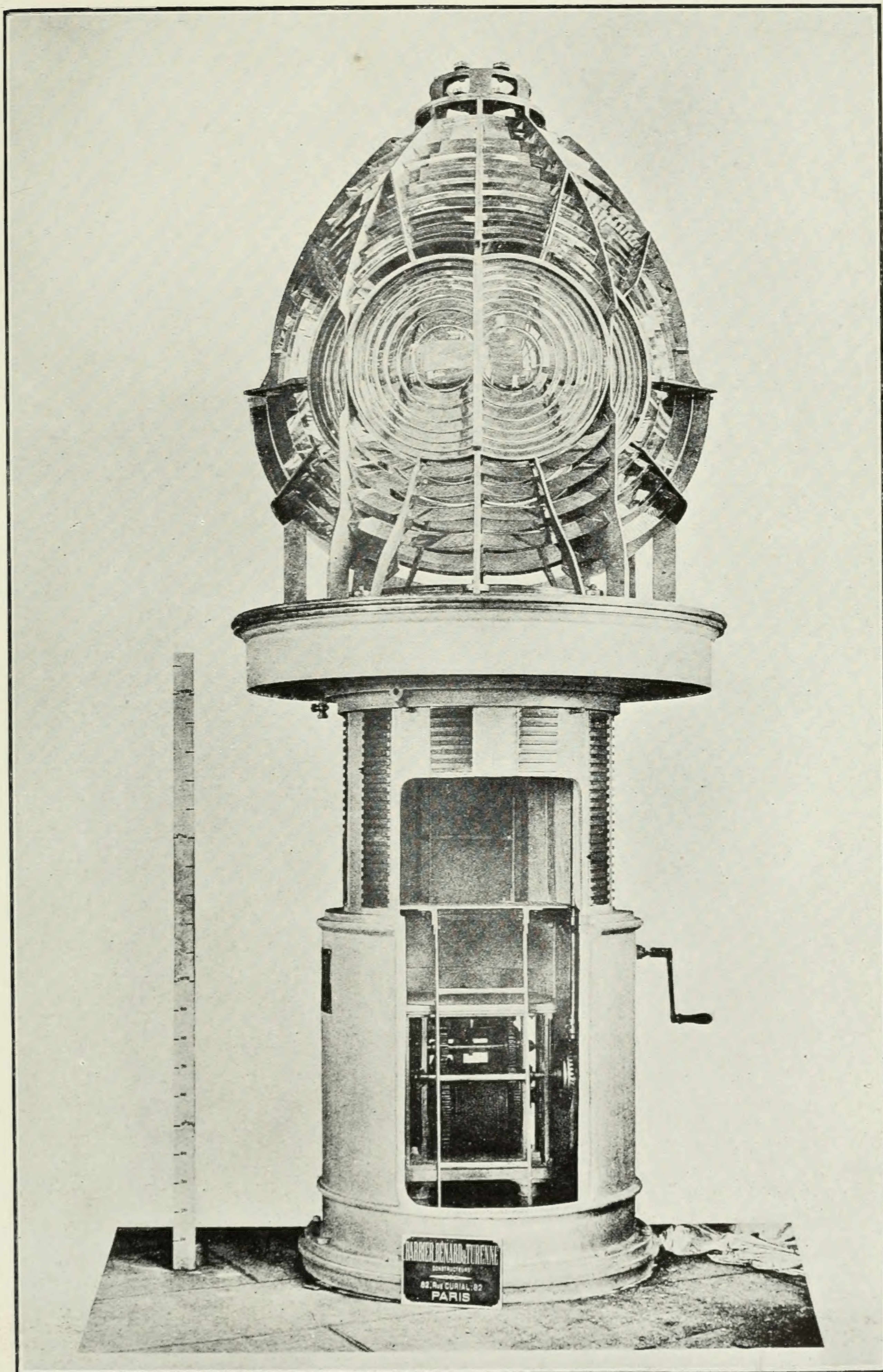


Occulting mechanism for use in connection with drum lenses.









Lightning-light apparatus of 3rd order, large size, showing a group of flashes every  $7\frac{1}{2}$  s.











